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ABSTRACT

Schools facing deteriorating conditions, high costs, and outdated building designs are tapping into the special capabilities of information technology to address the learning needs of their students. This book guides school leaders through school facility planning and technology systems planning, describing the importance of long-range planning and revealing the decision-making faced by some school leaders who have led successful facility design efforts. It recommends a seven-step process that distinguishes what facilities a school district needs and how to gain community support. The book also examines how to select an architectural firm and how to work with it to create educational specifications and building designs that accommodate technology use, including the design of technology-rich spaces such as media centers. Concluding chapters define the infrastructure options school leaders can choose from, and examine the step-by-step approach of a bond issue campaign a school district may need to fund new and remodeled facilities. A list of recommended resources, glossaries of architectural and technology infrastructure terms, and National School Boards Association's publications and ordering forms are provided. (GR)

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TECHNOLOGY & SCHOOL DESIGN

CREATING SPACES for Learning

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An ITTE Technology Leadership Network Special Report

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TECHNOLOGY & SCHOOL DESIGN

CREATING SPACES

for learning

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* Founded in 1950 as a one-person architectural practice, The Hollis & Miller Group Inc. has steadily grown to include 48 professionals specializing in architecture, planning, and interior design. The firm is structured as a general corporation and based in the Kansas City metropolitan area. Hollis & Miller recognizes the need to include in all buildings it designs the basic infrastructure to support the implementation of voice, video and data networks, and the necessity of a school district planning process that includes the design of learning environments that support the use of technology. The company's offices are located at 5000 W. 95th St., Suite 100, Prairie Village, KS 66207-3363 (913/642-6111) and 220 N.W. Executive Way, suite 100, Lee's Summit, MO 64063 (816/525-5600).

Excellence and Equity in Public Education through School Board Leadership

Dear Education Leader:

Students need school buildings that enable teachers and technology to operate at peak performance. All too often, however, America's school buildings lack not only technology but even safe, comfortable spaces for learning.

School leaders must accept the sizable challenges of incorporating infrastructure and designing spaces to support student achievement – and of funding the effort. *Technology & School Design: Creating Spaces for Learning* is meant to help you surmount those challenges. It offers a model for long-range facility planning, tells how to work with an architectural firm, describes technology-rich school spaces and infrastructure options, and advises how to manage a bond issue campaign to raise funds as needed. Leading architects, engineers, education consultants, and school practitioners have contributed to this work.

NSBA supports educators as they apply technology for learners' benefit through its Institute for the Transfer of Technology to Education (ITTE), which produces meetings, site visits, the annual Technology + Learning conference, a Web site, online listservs, *Technology Leadership News* newsletter, and leadership guides such as this one. More than 450 school districts in the United States, Canada, and the United Kingdom participate in ITTE through its Technology Leadership Network, applying networking opportunities that save them from "reinventing the wheel."

We wish you success in creating effective spaces for learning and urge you to call on NSBA and ITTE to assist you further as you and your schools grow into the future.

Sincerely,

Barbara M. Wheeler
President

Anne L. Bryant
Executive Director

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The National School Boards Association's Institute for the Transfer of Technology to Education and its Technology Leadership Network

The National School Boards Association established the Institute for the Transfer of Technology to Education (ITTE) in 1985 to advance the wise and appropriate use of technology in public education. The Technology Leadership Network, a major component of ITTE, was created in 1986 to help school districts share in dialogue about technology in education.

Special reports such as this one are among the benefits of participation in the Technology Leadership Network. *Technology Leadership News* newsletter, the annual Technology + Learning Conference, site visits to exemplary school districts, topical meetings, and an online listserv are some of the additional opportunities.

See ITTE's Web site, http://www.nsba.org/itte, for information on events, activities, publications, and the 450 school districts currently participating in the Technology Leadership Network, or contact the ITTE staff at NSBA, 1680 Duke St., Alexandria, VA 22314, (703) 838-6722. For more information about NSBA and its mission and vision, see the last page of this book.

Copies of *Technology & School Design: Creating Spaces for Learning* are available for purchase through the NSBA Distribution Center, P.O. Box 161, Annapolis Jct., MD 20701-0161, (800) 706-6722, fax (301) 604-0158.

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Introduction

School facilities are undoubtedly the largest capital investment for which school leaders are responsible. It is not an easy task. Among the challenges:

Deteriorating conditions The worth of existing school facilities in the United States is estimated in the trillions of dollars, yet many of those facilities are dangerously decayed. Many need substantial renovation just to be safe to attend. In 1995, the federal government's General Accounting Office estimated that a minimum investment of $112 billion would be required to repair or upgrade America's schools to good overall condition.

High cost Building or renovating schools is a big-ticket item that usually comes straight out of the community's pocketbook. That's why a community's first response to a facilities bond issue often is to say "No." As a result, many school districts now look at their planned enhanced-learning facilities as places that can support the needs – and appeal to the interests – of the entire community to gain its support.

Outdated designs Most school facilities are not appropriate for what is taught in today's schools. Facilities that are decades old were designed for a method of instruction that has become largely obsolete. Current – and future – methods of instruction require spaces that support dynamic, technology-rich learning activities.

To address those learning needs, schools are tapping the special capabilities of information technology. The benefits are many and are expanding with new technological developments.

Learners can reap tremendous gains from technology-based learning materials and communications tools that link them with experts and other students locally and worldwide. Technology also gives them exposure to tools they'll use in careers. Going a step further, technology is enabling students to create, present, and distribute educational materials to others. And electronic portfolios are giving students a better picture of their accomplishments, enabling self-evaluation.

Teachers similarly are using technology to create and introduce instructional materials, communicate with experts and subject-area peers, learn new techniques, and track and evaluate student performance.

Just as technology is changing how students learn, it also is providing answers to how school facilities should be planned, how they are designed, and how they can become vibrant community center points. The difficult role for

school leaders: Map out how all this gets done, while also planning ahead for future technological developments and learning needs.

This book is designed to guide school leaders through school facility planning and technology systems planning. Technology is very much a moving target, making it particularly essential for schools to take a systematic, continually updated approach to including it in facility design.

Infrastructure and Facilities

As they plan, school leaders need to pay special attention to voice, video, and data systems to make truly dynamic and beneficial use of technology. Making those systems work requires building **infrastructure** – wires, fiber-optic cables, telephone lines, wireless networks, and other solutions that allow technologies to communicate with each other. That infrastructure must be designed with flexibility to allow for future developments in technology and for expanding demand.

In planning **facilities**, school leaders must recognize that technology today requires specialized spaces with room for later expansion. Many early computer labs were packed into closets, old locker rooms, or whatever other space was available. Students often sat shoulder to shoulder to get the maximum number of bodies and computers into an available space, often without adequate ventilation, heating, air-conditioning, lighting, or furnishings to make the most of the learning experience. The benefits of technologies available to education today are so great that such inadequacy is completely inappropriate.

Not all computer spaces should be created equal. Libraries, predicted by some to be growing smaller because of technology, in fact are becoming *larger* because of technology. Many sources of information now are available in electronic format, and many new and exciting spaces – such as multimedia labs, electronic cafes, video production studios, distance learning centers, teleconferencing centers, and infrastructure head-end rooms – have become common, integral parts of school library/media centers.

About this Book

Planning is the heart of making technology happen in schools. Chapter 2 of this book recommends a seven-step process that not only distinguishes what facilities a school district needs but also brings the entire community on board with the final plan. Chapter 3 tells how to select an architectural firm and to work with it to create educational specifications and design school buildings that accommodate technology use. Chapter 4 focuses on the design of technology-rich spaces, particularly the media center. Chapter 5 gets technical, defining the infrastructure options school leaders choose among. And Chapter 6 takes you step-by-step through a bond issue campaign, which your district may need to fund new and remodeled facilities.

To begin, Chapter 1 describes the importance of long-range facility planning and acclimates you to that task by immersing you in the decision-making faced by some school leaders who have led successful facility design efforts.

The authors, editors, and contributors to *Technology & School Design: Creating Spaces for Learning* appreciate the effort it takes to conceive and create new learning spaces. Our hope is that this book will guide you through the ongoing challenges to outcomes that will make it all worthwhile, enable technology to meet its potential in your schools, and ultimately lead to improved student achievement in your community.

Chapter 1: Make Time for Planning

Buildings do not arrive in kit form. Each school building, whether a new facility or a renovation, must be responsive to the needs of the education program and the community. While a few school designs can be "cookie cut" for repeated use within a community, most cannot be transported successfully to other communities.

Likewise, school districts do not share a single standard for adopting technology. Each district's needs must be identified and addressed by first developing a comprehensive technology plan specifically for its schools.

School districts historically have operated more often from a technology "wish list" than from a comprehensive technology plan. In such cases, the technology program moves ahead only if the district is lucky enough to find some source of additional funding. Even if funding is found, the planless district lacks the conceptual definition it needs before it can successfully direct architects and consultants to plan and design technology-supported spaces and systems.

Take the Time to Plan

Time is money. And, perhaps as a result, it seems that most buildings are planned in an emergency mode. The money is available, the bond issues are passed, and the facility was needed yesterday. So a breakneck effort gets underway to plan, design, and build in the shortest time possible.

In buildings and technology systems, however, breakneck planning rarely creates the most cost-effective design. Planners need significant time to develop plans and suggestions that provide options for the client. Many times it is a second solution that provides the best, most cost-effective design. Unrealistic time constraints should be avoided whenever possible.

The next chapter will immerse you in the how's and why's of the sizable task of creating a long-range facility plan. For now, "get your feet wet" by reading

what some leaders in the field say about their own experience in planning and creating technology-infused spaces for learning.

York (NE) Elementary School

Nebraska's York Elementary School has an extremely flexible design that supports multifaceted instruction. It also has one of the most advanced technology installations found in any elementary school in the United States, as it includes a fiber-optic infrastructure that supports a telephone in every classroom, a switched Ethernet data network on fiber to each desktop, and a comprehensive two-way video distribution system that also runs on fiber optics.

Co-principal Woody Ziegler, who was involved in every planning step, shares the following tips from York Elementary's experience.

Ten Things We Would Do Again

- Create good communications. Keeping the teaching staff fully involved with planning the building is essential, as is working with an architect who will listen.
- Plan for growth. It makes lots of sense to plan the wiring infrastructure around projected future growth, not just what is currently the case.
- Use advice from other school districts that have been through the same thing.
- Create extra classrooms. Planning ahead means there won't be a need for temporary buildings on the site in five years.
- Build also for adult/community use. Enhance the building's multi-use possibilities by considering these additional users when planning areas such as a multipurpose room, a gym, and hallways that could be designed to appeal to mall walkers.
- Include a room for day care.
- Work out a traffic management plan. Separate bus and automobile traffic patterns go a long way toward preventing traffic jams.
- Landscape and fence to create safe, visually appealing school grounds.
- Purchase good-quality furnishings that fit the developmental size of the students for classrooms, offices, restrooms, playgrounds, and the like.
- Provide for communication and technology in every classroom and support space. Also wire storerooms and closets, as these may become learning spaces at some later date.

Ten Things We Would Do Differently

- Include a senior citizens center.
- Make the teacher/staff room/lounge a separate area away from school activity.
- Coordinate the promises made by school board members during the

bond issue and keep the administrative team informed.

- Increase the parking area, especially visitor parking.
- Improve acoustics in the multipurpose room to allow for all types of activities and provide a sound system that could serve multiple purposes.
- Provide more adequate space for the head-end room and data center, as school technology is sure to grow.
- Include the cost of technology infrastructure and instructional technology hardware in the bond issue.
- Involve a technology consultant before planning the building.
- Coordinate the traditional communications tools built-in by architects with technology planners to avoid duplicating systems and save money.
- Plan the library/media center around technology-based information systems and activities.
- Allow more adequate space in classrooms for technology. Computers take up a fair amount of square footage.

Grand Prairie (TX) Independent School District

In his former role as director of technology for the Grand Prairie (TX) Independent School District, John Yarrow launched a comprehensive instructional technology program and technology infrastructure including fiber-optic networking in all school buildings. Today, as director of applications and operations for the Richardson (TX) Independent School District, he's launching a similar effort.

Yarrow believes there are four common mistakes school districts make when implementing technology.

Mistake 1: Buying the cheapest hardware. Doing so means the school district is purchasing computers that already are outdated. Software today is always written for the latest chip, and software vendors rarely worry about backward compatibility. Instead, adopt the philosophy of buying the very best the district can afford.

Computers donated by other organizations often are out of date. If these machines can't be dedicated to limited tasks and if it would be impolitic to decline the donation, consider making arrangements for a used-computer broker to buy the donated machines from the school district and thereby generate some funds.

Mistake 2: Failing to buy enough software to make it worth teachers' time to use their computers for more than word processing. Teachers cannot get excited about using computers only to teach children how to type

Mistake 3: Not providing teachers training on how to use computers and software. Institute a comprehensive training plan. Grand Prairie ISD trained

90 percent of its 1,100 teachers in one summer, with each teacher receiving a week of training. During training, teachers discussed instructional strategies that would help them integrate computers as instructional tools. Grand Prairie also developed a technology-mentor program that trained one teacher at each campus to present training mini-sessions throughout the year.

Mistake 4: Providing inadequate support. Several mission-critical aspects of administrative networks require constant attention. Administrative computers, networks, and software are generally well cared for by data processing centers. But school districts often fall short of supporting their teachers and instructional technology. Instead, invest heavily — in terms of both effort and money – in teacher support.

Looking back on his infrastructure design work, Yarrow recommends that other school technology leaders:

- Hire an expert consultant *at the very start of the project* to write the school district's request for proposals (RFPs), requests for information (RFIs), and contracts that protect the school district; and to facilitate the planning and design process. The consultant's technical and communications expertise will be crucial to the effort. Everyone in the school district already has a job to do on a day-to-day basis and should not be asked to commit additional time to project management.
- Work closely with the consultant to assure that bids from vendors will enable the school district to compare "oranges to oranges" when considering where to purchase components and to focus on the school district's actual needs.
- Scan all building plans into a computer-aided design (CAD) format and have technology department personnel "walk" the buildings on screen before issuing an RFP. This ensures that the CAD floor plans are correct — or that they will be corrected — and can deliver an accurate assessment of where and how many network drops are needed.
- Give vendors CAD building plans to supply them with crucial guidelines. Scan and provide paper copies or disk copies. You can charge a small fee to offset costs.
- Clarify for vendors the difference in instructional (classroom) drops and administrative (office) drops. This will enable them to recommend streamlining infrastructure by eliminating wiring for video, which is not necessary in office areas, and providing enough wire capacity for telephones in office areas.
- Write one RFP for network cable installation and a separate RFP for network electronics. Very few vendors can do the best job in both of these categories, and you probably can save money by encouraging specialized vendors to respond to separate RFPs.

- Don't go with the cheapest bid; go with the best solution. Choosing a lowest bid often results in problems and even adversarial relationships. Make sure your consultant writes "ironclad" contracts that force contractors to deliver as promised.

- Be cautious about media distribution systems. Grand Prairie ISD installed cabling to accommodate media distribution, then shied away from implementation because of expense. As price levels drop, video on demand systems will be more accessible to schools.

- Select a fiber-optic cable plant for data network. Grand Prairie ISD did, and consequently it won't have to recable for at least 20 years. The district's fiber cable came with a 15-year warranty. Upgrading the network will be just a matter of replacing network hardware.

- Consider choosing Windows NT as the network operating system. It takes fewer people to manage than do other operating systems. And like the Internet, it uses independent protocol (IP) as its network protocol that will facilitate development of an Intranet.

- Buy file servers that are self monitoring. Less staff is required to manage a network when the servers communicate with a console in the network command center. Network technicians do not have to drive to each site (over 30 in Grand Prairie ISD) to check on server operation.

- Build the network for future bandwidth growth. With only one shot at using bond money to build its network, Grand Prairie wanted to drive as far as possible into the future. Its fiber infrastructure enables upgrades with a minimum of hardware changes and without rewiring.

- Write and develop an instructional technology plan to drive the requirements of the network. Build with instruction at the forefront, and let the administrative side (which requires less bandwidth) take care of itself by piggy-backing on the instructional network.

- Hire a network manager who is a wide area network (WAN) expert as well as a local area network (LAN) expert. Hire someone who has not only "paper certification" but also has "been there, done that, and got a techie T-shirt to prove it." Also, protect your investment by paying a network manger what he or she is worth. Otherwise, you can spend up to $20,000 to train this individual only to have them leave after a year's experience with you to go make twice as much in the "real world."

- Keep everyone in the loop. Work closely with the superintendent and keep the school board up to date on what is happening. With big-ticket expenditures, everyone gets nervous about how things are progressing.

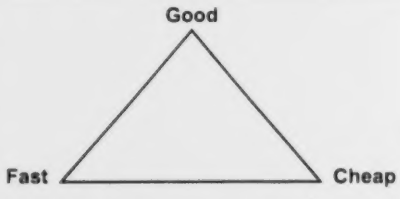
Information goes a long way toward calming nerves.

- Never trust a vendor. This sounds harsh, but think about it this way: a vendors' best interest is not necessarily a school system's best interest. School districts should constantly monitor their vendors to make sure they fulfill their end of the bargain.
- Never allow a vendor to change brand names after the contract has been signed, unless you are certain it is to the school district's advantage.
- Never expect deadlines to be met. Instead, figure the timeline by doubling the time promised and then adding two or three months. One way to deal with this is to include liquidated damages as part of the RFP and stick to the contract finish dates.

Some Final Thoughts on Planning from Roger Ault

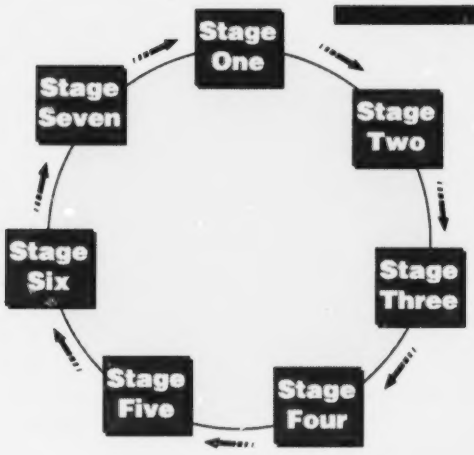
Roger Ault, a widely recognized leader in education technology, is director of technology of District 113, Highland Park, in Deerfield, IL. District 113 has one of the first high schools with fiber-optic networking and a computer on every teacher's desk. Ault offers the following maxims that may help along the way.

- Plan — but don't plan forever.
- Proper prior planning prevents poor performance.
- Failing to plan is planning to fail.
- A plan is not a detailed purchase order.



When planning for networks, remember this design axiom. Pick any two on the above triangle, and the third is not true! For example, if the network is good and fast, it will not be cheap!

— Roger Ault, Director of Technology
District 113, Highland Park
Deerfield, Illinois



Chapter 2: Long-Range Facility Planning

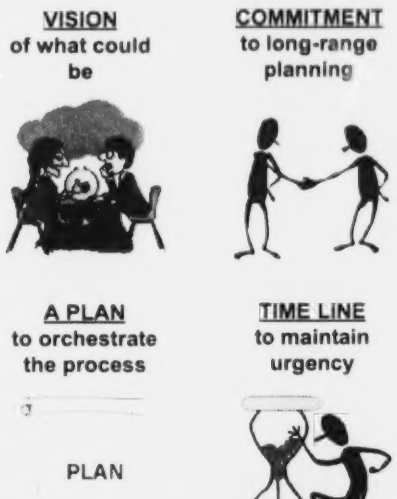
A carefully thought out long-range plan is the key to getting the education facilities your school district wants and needs. This chapter discusses how to put one in place.

Planning acts as a rudder on your school district's "ship." With this rudder you can guide, direct, and steer your district to the destination you desire. Without your rudder, your district drifts at the mercy of the winds, and when you find land, it probably will not be the place you wanted.

In more practical terms, your school district patrons want and deserve to know how their money is being spent and whether the expenditure makes good sense in terms of their community's education. Long-range planning takes significant time and effort, but it's essential and the results are worth it.

Essential Elements

No single long-range facility plan works for everyone. Whatever plan your district adopts, however, it needs to have the following four components to succeed:



Vision – Most major breakthroughs in our society can be traced back to someone or some group that had an idea of what could be. In developing a "vision statement" of what the school district can be, it is important to understand whose vision it is. Is it the vision of the school board, school administration, teachers, businesses, or community? Ideally, a vision statement is developed by all these parties in collaboration to reflect their collective goals and desires. The synergistic effect and results of the different groups working toward a common vision truly is greater than the sum of the various parts.

Commitment – Long-range planning can be a lengthy, demanding, yet highly gratifying and rewarding process. Individuals must enter the process without bias, be able to think critically to arrive at creative solutions, be capable of compromising to reach consensus, and be committed to reviewing mountains of data, reports, and studies to understand all the facts before looking into possible solutions. Regardless of the simplicity or sophistication of the long-range plan, the planners' commitment to the process is essential.

A Plan – A way to bring quick ownership and commitment to any long-range planning process is to adopt a step-by-step process with clearly defined starting and ending points. Any long-range facility plan should clearly and systematically spell out each step of the process, who is involved, and when it is to be completed. Without this kind of structure, the planning effort is likely to wander aimlessly, leading to no useful conclusion. The seven-stage model for long-range facility planning described in this chapter has been successful in many school districts.

Timeline – The last component of a successful long-range plan is a realistic proposed timeline. A proposed timeline, which becomes the official timeline when it is approved by the school board, provides two needed elements. First, it tells all participants of what level of commitment is expected and when the commitment is expected. Second, it provides what might be called common-sense urgency, making sure that momentum is maintained.

The Benefits of Planning

When developed properly, a long-range facility plan can provide numerous positive and tangible results, including:

- A road map for using facilities and funds
- A sense of ownership that results in increased community support
- Staff focus and commitment
- Credibility among patrons

Road map – A great benefit of long-range facility planning is deliberate, planned use both of facilities and the funding it takes to construct and maintain them. For instance, it is planning that keeps a school district from spending $250,000 to repair a school roof and then, a year later, closing the school.

Even with new construction, significant capital can be saved when buildings and reconfigurations take into account the long-range perspective.

Ownership – One of the nicest byproducts of collaborative long-range planning is that the individuals taking part in the process often become some of the best and strongest allies of your school district. They become vested in its success. The ownership and buy-in these individuals provide results in pride and determination to see that the long-range plan is successfully sold and implemented. Yet another positive byproduct: more dialogue and partnerships between districts, private businesses, and other institutions.

Staff focus and commitment – Communication at all levels is essential in a project, and long- range planning is no exception. Teaming with staff and sharing decision-making help guarantee success. If respected members of the school district's staff are included in the long-range planning group, the result is increased trust, cooperation, and commitment.

Credibility among patrons – A school district functions well when credibility is maintained, and long-range facility planning can be the source of credibility at many levels. In this era of increased concern about taxes and waste, it is long-range planning that provides objective data to addresses patrons' priorities.

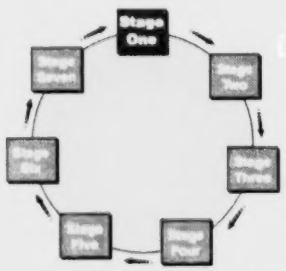
The Seven Stages

To create an effective long-range facility planning model, follow this seven-stage process:

1. Get started
2. Gather information and data
3. Identify needs
4. Explore options
5. Refine the plan
6. Implement the plan
7. Review, evaluate, and update (closing the planning loop)

Each stage is described in this chapter. The planning process is an orderly series of successive steps, each building on those that come before. Often there is a tendency to jump from A to Z without all the steps in between. Resist that impulse!

Stage One – Get Started



In Stage One, a diverse group of constituent group representatives develop the goals and strategies needed to get to achieve your district's long-range facility planning vi-

sion. Your school district's planning group will need to:

- Clearly identify the process the group is using.
- Anticipate an outcome for each phase.
- Carefully define the objective of the longrange facility plan.
- Prepare a schedule or timeline for the phases or activities of the facility plan. Keep the school calendar and seasonal activities in mind and allow a reasonable amount of time for each phase. Try to plan for staff input in early spring and assessing buildings during summer.
- Ensure your objectives and timeline are on target with the school board.
- Educate the district – especially those closely involved in planning and those who will approve the final plan – about the planning process.
- Build in reporting mechanisms and milestones, as well as time for the planning group or school board to react to information.

Creating a planning group

Creating a planning group or team, a blue-ribbon committee, or a task force is a good starting point. Regardless of what you call your planning group, a team approach is necessary. The school district and the planning group need to understand that:

- Reaching consensus is the objective.
- Getting to consensus is a challenge.
- Developing a leadership structure to guide the effort is important.
- Developing a process to follow is crucial.
- Retaining someone (or several people) to guide the school district through the process is wise.

Membership in the planning group must be broad, representing parents, staff, administrators, and the school board. Members must understand the general process that will be used and know the needs of the district. They must be open to exploring alternatives, not focused on predetermined solutions. Flexibility is key. They must be willing to evaluate options, make decisions, and follow the course through.

Retaining a consultant to guide the group through the process is an excellent idea. Whether the consultant is an architect or an educational planner, he or she knows the process and is skilled at fact finding, pinpointing assumptions (goals), selecting input, and most important, facilitating the process. A consultant can keep your planning team on schedule and on target.

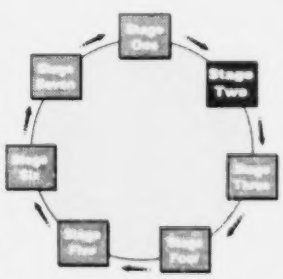
In the latter stages of the process, employ a facilitator to assist with your planning group. The facilitator might be your consultant or someone else. An individual from outside the school district can help keep the group on schedule and on target. The facilitator should be capable of bringing people to consensus; keeping the perspective focused on the outcome; and permitting documen-

tation and exploration of supporting information. While a facilitator keeps the process orderly and the planning group on track, ensuring that it does not go off on a tangent, he or she also enables a flexible process that accommodates questions and changes.

The planning group should be empowered to bring solutions and plans to the school board for decision. The group alone cannot set the school district's tone; it must provide information and put the board in a position to have a well-informed final say. Conversely, the school board must rely on and have confidence in the planning group, knowing that its guidance and ideas are realistic.

The planning process must start with a defined goal (or goals), target date for completion, and stated expectations. At this early stage in the process, defining the goals may be as simple as "develop guidelines for new facilities," or as complex as "set parameters for middle school education." In addition, the planning group must have the tools at its disposal to investigate and find facts that allow it to make assumptions and draw conclusions.

Stage Two — Gather Information and Data



General Douglas MacArthur once said "You have to know where you have been before you can establish where you are going." The maxim applies well to facility planning.

In Stage Two, the planning group gains greater understanding of the current conditions and environment in which your students learn. It is safe to say that no long-range facility planning ever has been successful without a clear understanding of current community attitudes and an objective understanding of the conditions of existing facilities.

Understand Your Community

As simple as it sounds, the first step in understanding your community is getting a clear picture of exactly what your community is. Many school districts overlap city and county boundaries, so it is sometimes surprising for newcomers in the planning process to discover the district boundaries cover a much larger area than they imagined. Another avenue to research is what governmental agencies are located within the district (such as county agencies and recreational commissions).

Also discover and document issues such as community beliefs, traditions, and aspirations. Community beliefs include ideas about loyalty and how people in the area react to new ideas. Is growth looked at positively or negatively? Traditions need to be acknowledged. Are there historical patterns within your community that can provide a stepping stone to gaining support for your planning effort? Are there customs that require a more subtle approach in order to maintain respect and understanding? What are the aspirations of your com-

munity? What is the biggest thing that can be done to improve your school district's image within your community? What do you like best about your community? Are there some common reasons among patrons as to why they choose to live in your community? The planning group can gather answers through formal polling or questionnaires. Be sure the group does this research outside its meetings to avoid "group think syndrome" or an "us versus them" viewpoint.

Appraise Your Facilities

One of the general public's most common objections to new facility planning is that "The old school was good enough for me. Why should we change it?"

Those of us involved in education and educational facilities continue to overestimate the general public's knowledge of how education and students have changed and how those changes have affected the demands on educational facilities. After all, you rarely hear someone question why a local service station is having its underground tanks replaced or why the neighborhood grocery store has been remodeled several times since it was built. And few successful businesses still exist in the same building or the same configuration for 50 or 60 years. The public, however, still somehow expects schools to remain exactly the same. And indeed, a majority of our classrooms are the same today as they were in the late 1970s.

Besides societal pressure, new laws have hindered the proliferation of more up-to-date school designs. Within the past 30 years, legislation designed to protect building occupants – from asbestos, for example – has ended up prescribing largely how school facility budgets are spent.

A facility appraisal can improve both the planning group's and the public's awareness of current and future school facility needs. For instance, a facility appraisal can look at school capacities to determine what is a realistic design capacity at a given location. A school that housed 500 students at capacity 20 years ago now might be adequate to house only 400 students because of changing demands and increased student programs, such as special education, technology, and a media center. A well-done appraisal can objectively point out why the building's capacity has changed.

When you audit your facilities, look at more than the obvious code, systems and building maintenance. Educational adequacy also is important. What is the environment, and how does your building compare to the norm? How does the building support or detract from the educational process? Color schemes, natural daylight, and a temperature-controlled environment are just a few examples of areas the can either greatly assist or distract from the educational process. A facility appraisal that provides all this information in a concise format goes a long way to very objectively answering the public's question,

"It was good enough for me – why change it?"

Review Background Studies

Three background studies need to be conducted to inform the planning group's efforts:

- Curriculum Study
- Technology Study
- Demographic Study

These studies can take significant time and should be performed early in the planning process.

The Curriculum Study

One of the greatest determining factors of success within a school district is the thoroughness and cohesiveness of its educational curriculum. If curriculum really is the heart of the educational process, then the importance of a curriculum study is obvious. Without curriculum planning, students' educational experiences become a scattered, random, unfocused series of learning events that provide an incomplete education.

Architect Mies van der Rohe's famous quote, "form follows function," points out that any good building design should reflect, support, and enhance the functions that occur inside it. Related to educational facilities and comprehensive strategic planning, it might be rephrased to say "function follows curriculum."

In the ideal world, curriculum should be the driving force behind any school building design. Too often, however, the spaces and needs of educators end up being shoehorned into a certain shape and form. Instead, the form should wrap around the educational spaces and needs of the curriculum and the people who teach and learn it.

Conducting a curriculum study makes it more likely that form and function will merge into a school building that works. It is designed to clearly state and review many aspects of the learning process, and it should incorporate and supplement the school district's mission statement that serves as the "big-picture overview."

At a minimum, a curriculum study indicates the success or failure of the current curriculum, reviews educational teaching methodologies, and discusses in-place instructional support systems. The study looks at the effect the curriculum has on student success or failure to determine where to focus any adjustments. Evidence of student success is reviewed, not just in terms of standardized-test scores but also in areas such as reducing dropout rates and interpreting college-retention data. Only by reviewing a multitude of interrelating factors can a clear, accurate picture of the success or failure of the curriculum be determined.

It also includes a review of, and recommendations about, instructional methodologies used within the school district. The study should serve as a

review of curriculum guides both in terms of content and degree of implementation.

Finally, a curriculum study looks at instructional support systems, including the timing and effectiveness of teacher inservice programs. Unless the curriculum's actual instructors are given an opportunity to learn, develop, and understand the curriculum, success will be elusive.

The Technology Study

As technology has become more important in the education process, it also has become an essential of the comprehensive strategic planning process. A technology study first should describe the current status of technology and technology programs in the school district.

It also should look at how the current level of technology has affected students accomplishments. Remain openminded when reviewing the results, recognizing that technology implementation is relatively new in most schools and in development. Often, as much can be learned from what has not worked as from what has. The long-term effect of doing objective research should serve to add credibility and buy-in.

A technology study should incorporate a complete review and inventory of the school district's current hardware, software, and technology training. For hardware and software, the current value should be estimated and a timeline should be developed to estimate longevity, or "shelf life." This can help ensure that your school district does not attempt to construct a cutting-edge instructional curriculum on an archaic, crumbling foundation of outofdate hardware and software.

Do not overlook the issue of training staff to implement technology with students effectively. For technology to be truly successful in schools, training is crucial. The new tools that technology makes available to educators can only be used to the fullest if appropriate and useful training occurs in advance of actual classroom implementation and if teachers have handson access to hardware and software.

A technology study also should discuss the appropriateness of the school district's existing facilities to handle technology. Most older buildings are not designed to handle the unique demands technology places on them, such as for special lighting, Internet access, and adequate clean power. The study should incorporate the effort and cost that would be necessary to integrate technology into existing facilities.

A technology study also often includes a review of national trends and innovations in educational technology. As these are reviewed, their appropriateness to your school district's curriculum and educational program should be considered.

The final element of a technology study is awareness planning. It seems like a simple concept, but it is often overlooked. When first considering technology and how to make use of it, your school district needs to determine

what it wants its students to learn. Only after you have determined this can you begin to look at the software that's needed in instruction. Then the district should look at its hardware requirements. This software-first approach might seem to be idealistic, but the converse — selecting hardware first — has not served teachers or students well in the past.

As awareness planning continues, it should provide direction for how technology currently is incorporated into the overall instructional process and how it aids the school district's management, accountability, and reporting. Then the study should project how technology can serve schools and the district in the future.

Demographic Study

Studies of human populations can, of course, vary greatly in their level of sophistication. Most, if not all, the data needed is available without charge from the U.S. Bureau of the Census or local county and city agencies.

To be useful, a demographic study should consider much more than whether a school district, its community, and its surrounding communities are growing or declining. A good demographic study provides details on historic, current, and future patterns in population.

When looking at the patterns and makeup of the population included in a demographic study area, issues such as age distribution, family sizes, and number of live births within the school district's boundaries need to be clearly understood. In addition, socioeconomic makeup and employment data needs to be collected and interpreted.

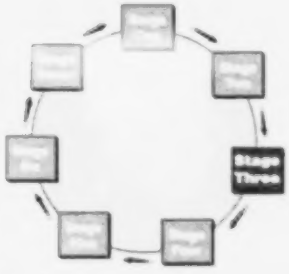
Other elements also greatly affect the trends and patterns within a demographic study area. Two of the most influential: economic development and the employment patterns within the community. Are major businesses and industries in the area projecting growth or decline? The degree to which businesses currently are being attracted or lost in a community likewise affects community makeup. Quality of life issues such as the cost of housing, tax levels, and community services (police, recreation, health care) also warrant attention.

Using the demographic study, the school district will be able to make projections about what type of growth should be expected and when. Be wary of making any projections that tie specific numbers to growth or decline. They rarely turn out to be exact, and then doubt is cast on the credibility of the study and any planning associated with it. Instead, provide scenarios of growth and decline with range estimates of what might occur.

Sometimes demographic studies also choose to label projections in a general way, such as "low-growth forecast," "high-growth forecast," or "most likely forecast." By providing enrollment projections within ranges, the strategic plan allows the school district the flexibility to adjust and react as actual enrollment occurs.

Once money, time, and other resources have been expended to produce the demographic study, it is wise to protect and maximize the district's original investment by recommending that the study be updated on a regular basis. Designate who will be responsible for that task.

Stage Three – Identify Need



The goal of Stage Three is to lay the groundwork to provide structure and objectivity to your long-range planning process. This raises a number of questions: How do you identify the school district's needs? How do you ensure that a need is not the desire of a special interest group or a response to an isolated requirement? How do you answer the person who says, "We don't need a facility plan. I already know what we need to design into our buildings and add on to our existing buildings."

The answer: a comprehensive, "no blinders" facility plan that identifies needs across the district. It gives you and your district's patrons an opportunity to say, "What if we were to have new buildings? What would they look like? What if we were to bring our existing buildings to the level of new buildings? What do we want to have in our facilities? What would we do if we were to start from scratch – starting all over with new facilities?"

One way to help identify facility needs is to write a facilities program for each building type -- elementary school, middle school or junior high school, and high school, or whatever your grade configuration. Compare your existing buildings against that program and let the differences identify your needs.

Another way would be to review established requirements for programs, media centers, industrial technology departments, and so on, and compare your existing facilities against those requirements.

The school district's staff also is a good source of immediate needs. Ask: What should we have in our classrooms today? What should we have tomorrow? What and how do we want to be teaching in 10 years, 15 years, and 20 years? What in a facility would help us accomplish our goal?

You could compare your district to norms in terms of classroom size, student-per-area ratios, and other aspects of other districts recently involved in building and remodeling. Or you could develop assumptions -- quantifiable, desirable goals to guide you to a facility plan. For example:

- We want our grades 3-5 to have no more than 28 students per classroom.
- We want all elementary schools to have art, music, and computer classrooms.

- We want high-school lockers to be equal in size for male and female athletes.

Then test your existing buildings or plans against those basic assumptions.

Develop criteria for your planning group's use in assessing ideas. Ask staff to help with prioritizing needs. Give them three options: which are necessary, which would be nice to have but not absolutely necessary, and which could you do without.

Long-range facility plans are dynamic documents that should be reviewed, updated, and modified on an annual basis. As educational needs change, facility needs change. Those changes should be reflected in plan updates.

Establish a Foundation for the Plan

By building planning group consensus, prioritizing needs, and creating objective planning criteria, your district's planning efforts will stay focused on the right priorities and maintain focus while creating positive momentum as you move ahead in the planning process.

Build Community Consensus

At this point in the process, if you have followed the previous steps, your entire planning group should have a very clear picture and understanding of the current condition of its school district. By reviewing facility appraisals, curriculum plans, technology plans, and demographic information, each of your planning group's members has acquired the necessary information to accurately begin to talk with the community at large.

One of the best ways to assure the success of your planning process is to get community input as early as possible. By allowing your planning group to work openly to encourage community participation, the final outcome will, with rare exception, be better understood and accepted.

The logical first step is to organize a strategy to canvas your community soliciting ideas, concerns, and most important, your patrons' perceptions of what is the greatest need for students in today's society. In most communities, you do not have to look very hard to find many groups and organizations from which to solicit this input. Some examples:

- PTAs
- Service Organizations
  - Rotary Club
  - Lions Club
  - Kiwanis Club
  - Veterans groups
- Chamber of Commerce
- City councils
- Church groups

Always remember that the primary purpose of the planning group's meeting with these community groups is to listen and gather ideas. The main goal should be to give your patrons and community organizations an opportunity to be heard.

When asked to present information to various groups, the planning group should not assume anything. The lack of understanding that the public has about its public schools often is surprising. Issues such as taxing authority and state-mandated programs are rarely understood. And in addition to educating the community regarding the school district's direction and programs, these meetings serve to establish two-way communication.

By establishing and demonstrating that your planning group and school district have sincere concern for the needs and desires of patrons and the organizations and businesses within district boundaries, you foster open and honest dialogue that eventually will be returned to the school district in the form of stronger credibility and buy-in for your planning process. Eventually it also will help get your long-range facility plan adopted.

If, for instance, determining a need for capital improvements is a result of your planning process, then the same credibility and buy-in gained in the planning process can become the backbone of a successful capital improvements campaign.

Prioritize Needs

Once your planning group has ample opportunity to solicit responses from your community, it is time to translate that input into usable information.

If ever there is a time to open your mind to new ideas and what could be, this is it. You can begin by thinking about what would be the ideal long-range vision or, in simpler terms, your wish list. Depending on the planning group members, business leaders, and educators, your district may be able to collectively look beyond what is common practice and accepted as standard to envision new possibilities. Sometimes futurists are asked to become involved with planning groups at this point to make sure people truly look forward instead of staying mired in the past. However it takes place, the focus of this effort is to look for the ideal as it relates to educational process, curriculum, and facility planning efforts will positively influence the community's children.

When your planning group works together to create "imagine-if" statements, you can get fantastic results that begin to form a core vision of what is possible. At in this stage, you want to continue to dream and not get bogged down in the details of "how tos," such as what it will cost or whether it fits well into a bond issue. All too often, a great idea gets thrown out of the mix too early because someone tries to debug it down to the slightest detail. There will be time for debugging in the future. For now, stick to visioning. Focus on educational issues – such as curriculum, technology, and demographics – and consider only slightly the actual buildings or facilities.

Once the various wish list and imagine-if statements have been completed, the next step is to begin developing a gen-

eral statement about the direction or intended outcome that can help realize the vision. Again, you don't yet need to completely figure out all the how's and why's.

The result should be 15 to 20 assumptions. They should be brief, clearly define a direction, and reinforce the vision of what you want your school district to be.

Develop Planning Criteria

The final step in determining needs is to develop planning criteria, an objective set of statements that clearly lay out the desires of the school district. The planning criteria will be used in evaluating different long-range planning options. They form the action plan for meeting broadly stated goals that might deal with issues such as:

Planning Criteria

Long-Range Plan
Carthage R-9 Public Schools, MO
January 11, 1996

1. Issues related to safety will be addressed.
2. Desirable maximum density of any elementary schools is 600 students.
3. School facilities shall handle at least two or more grade levels to minimize transition.
4. It is desirable to integrate the ninth grade into any existing or new senior high school facility. (9-12)
5. For educational purposes, a 6-8 (7-8) middle school is desirable.
6. A phased capital improvements plan should be considered if needs exceed funds.
7. As a minimum, it is desirable to discontinue use of Eugene Field School and Hawthorne School for educational purposes, and build a new elementary.
8. Special education services shall be offered in each attendance center.
9. All-day Kindergarten is going to occur; any long-range plan should provide accommodations.
10. When reviewing building options, the issue of "staffing and operational efficiency" shall be a strong consideration.
11. Any capital improvements plan shall provide for technology infrastructure in district facilities.
12. Appropriately sized and equipped media centers, technology labs, music rooms, art rooms, and cafeterias shall be provided at each attendance center.
13. Planning should anticipate student population growth.
14. Any future site that is required to complete the long-range plan shall be acquired in advance.
15. Early childhood program should be housed in a single location due to specialized material and efficient staff usage.
16. School district offices shall be merged into a single location.
17. A long-term goal shall be to provide a temperature-controlled environment for each student and staff member of Carthage R-9 schools.
18. For planning purposes, all portable trailers shall not be considered as usable and occupiable space for students.
19. For the purpose of current and future site considerations, the following site area ranges shall be considered:

    Elementary School:
    15-16 acres (10 acres + 1 acre/100)

    Middle School:
    29-30 acres (20 acres + 1 acre/100)

    Senior High School:
    40-42 acres (30 acres + 1 acre/100)

- How large your school district wants elementary schools to be
- The grade configurations your school district prefers

Later, in Stage Four, we will discuss how to develop multiple options and scenarios for different long-range plans. But at this point, the planning group has a fixed picture — in educational terms — of what it wants. Without planning criteria in hand, your district would risk straying from the original input and consensus that the group has built to date both within the group and with the community. If you stray too far, the process can quickly turn from creating credibility to mutiny.

Properly developed planning criteria build credibility with long-term benefits:

- Later in the process (such as in the middle of a capital campaign) when someone asks "Why did you decide to do that?" the planning group can refer to the planning criteria and describe how they resulted from community input and consensus building.
- If a patron, school board member, or outspoken citizen who focuses on one particular issue challenges the eventual plan for not addressing that issue as they want, the planning group will have an objective, widely agreed upon list of desirable district outcomes with which to defend against consensus-busting without having to directly confront the individual on his or her hot-button issue.
- On an annual basis, the planning criteria can serve all involved as a tool to keep the school district headed in its proper course. After a couple of years, this set of statements will become an integral part of the culture of your school district, school board, and community.

By generating this common set of planning criteria at this stage, you greatly improve your chances of maintaining community support over the long haul versus having to go through the whole process of generating community buy-in each time you need support for a proposed capital improvements campaign.

By building committee consensus, prioritizing needs, and creating planning criteria, you will be able to make sure your process addresses critical priorities and maintains positive progress toward a complete and thorough long-range plan.

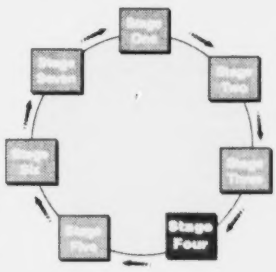
In summary, Stage Three includes:

Wish List =
Vision

Assumptions =
Goals

Planning Criteria =
Strategy

Stage Four – Explore Options



The goal of Stage Four is for the planning group to recommend a long-range facility plan to the school board. After careful review of multiple options that take into account both current and future use of existing facilities. Stage Four also provides ideas on how to find a true win-win, long-range planning option that addresses not just facilities but curriculum, technology, and changing demographics, one that should be well-received by the school board and, eventually, by the school district's patrons.

Maximize Existing Resources

By following the progressive stages of this planning process, each group member by now should be well informed and comfortable about making recommendations on the basis of the objective material they have assembled.

Back in Stage Two, facility appraisals enhanced your group's awareness of the overall conditions and educational adequacy of each existing facility in the school district. Your group now is armed with "planning criteria," as described in Stage Three, and it is poised to make preliminary decisions based on those criteria.

If the planning group wants to maximize use of existing facilities, now is the time to force the thought process and expectations beyond the obvious. One of the most difficult obstacles is community members' difficulty seeing those existing facilities as anything different than "my old school."

Compare Options

The next step in exploring options is to create a series of districtwide "broad-scope options" describing alternatives for the eventual long-range facility plan.

Broad-scope options dealing with facilities should be the result of quick, spontaneous ideas and suggestions emitting from your wish list and planning criteria. A brainstorming session is probably the best way for the planning group to develop these. Without imposing limits, ask the group to generate ideas or solutions, grade-level configurations, phasing options, temporary uses, and so on. No idea is too far fetched; blinders should be left off; and thinking should be "outside the box."

Broad-scope options might address:

- What does it mean if we decide to limit the size of each school to 350 students?
- What if the projected car plant comes to this community? What if it doesn't?
- What are possible ways to deal with the projected growth of our elementary school population?

- Why might we want to change the grade configuration of our middle schools?

Creating and studying the resulting options should be an easy, creative, and stimulating process. This is another point where it would be a mistake to get too detailed or attempt to address every issue. The more options considered, the more opportunity there is for creating the best solution.

Realize that there probably won't be a lone broad-scope option that addresses every district priority. Typically, the "best" solution is reached by combining multiple options. It is not uncommon to create as many as 15 to 20 broad-scope options that in one way or another address the district's long-term vision and goals. These options should be developed in an agreed-on, consistent format (graphic, matrix, or written) to maintain objectivity at the next step: evaluation. Once the options are formatted, the group should investigate preliminary cost figures for each.

Up until this point, the planning group has been asked only to create as many options as possible without considering or evaluating what works and what does not. Now, the group begins overlapping the options with the planning background it established to date. Taking the list of "planning criteria," the group should test each broad-scope option to determine how well it meets those criteria. By evaluating all the options against a single, defined list of criteria, the group is assured that it remains objective and won't be swayed by the wants and desires of a particular view that might not be in the school district's best interest.

As the planning group evaluates the broad-scope options, it must look beyond bricks and mortar and remember the other elements of the plan, such as curriculum (the most important), technology, and demographics. The preliminary cost figures for each broad-scope option allow the group to compare which options are delivering the most bang for the buck. Typically, as each option is considered, some are eliminated and others are combined to address as many issues as possible within a single broad-scope option.

By the end of this evaluation step, the planning group should be ready to present to the school board the planning criteria and two or three options that it believes best address the needs of the district. Often, several options are presented to the board for its review and final selection/adoption.

If the group presents the board with a single option, the board can either adopt it or reject it. Most boards have a diverse makeup, and odds favor that not all the board members will want to embrace a single plan. The planning group should present several options it can live with and then let the school board massage and choose among them.

Determine Win-Win Solution

In presenting broad-scope options to the school board, the planning group needs to describe how it gathered information from the community; give a brief overview of the appraisal process; and discuss in depth how it created its wish list and planning criteria. By concisely laying out the planning process to the board, the planning group helps establish additional credibility.

The planning group should demonstrate to the board how it objectively evaluated each option against the planning criteria so that the board can experience the process as well as see the results. Mention all aspects of the plan, curriculum, technology, demographics, and other major components. Remember – and remind the board – that this is only the first of several presentations the planning group will be making as the options, community reactions to the options, and then the actual plan are put before the board.

Once the school board reviews the materials and adopts one of the broad-scope options (or creates its own hybrid option), it is time to test the selected option in the community. Using the same organizations and groups addressed in Stage Three, the planning group works to build community consensus. The group might begin to test the broad-scope option with a series of presentations and follow-up question-and-answer sessions. In most cases, these groups will be excited to see how the input they provided has become an integral part of a solution.

Again, as with the school board, the planning group should describe the groundwork of the planning process. Remind community groups of their input; share with them the way the planning criteria were developed; and make sure they understand the planning group is there to receive additional input, not just to tell them what has been decided.

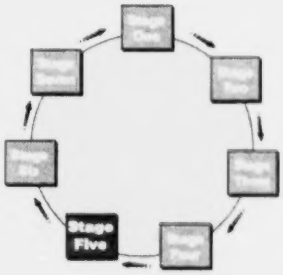
After meeting with the various groups and organizations, the planning group should work to integrate the feedback received and prepare to share its findings with the school board.

A final presentation to the school board should describe the community input the planning group received and demonstrate what has been modified since the board's last consideration. Presenters should be deliberate, constantly referring back to the planning criteria as the group's objective tool in making sure the plan addresses the proper priorities. The goal of this presentation is for the board adopt a single, overarching broad-scope option for the long-range plan.

It is at this point in the planning process that the foundation of objectivity and citizen input will begin to pay top dividends. By reviewing many plans, having combined input, and building consensus among board members, planning group members, and patrons, the process should assure a seemingly il-

lusive win-win solution. Now it is time to take the approved broad-scope plan and make it real.

Stage Five – Refine the Plan



The goal of Stage Five is to refine a very broad-scope idea of a long-range facility plan into a very specific and useable tool that will provide direction and focus for the school district. In this last stage of preparing the long-range facility plan, the planning group will be able to appreciate the benefits of their good planning process as they collectively finalize and document the results of their hard work.

Organize All Elements

At this point, the school board has adopted a broad-scope, long-range facility plan that has a wide base of understanding and community support. The next step is to refine that plan into a working document.

The broad-scope option the school board approved was essentially an idea. Now is the time to make that idea come to life and become an instrument that guides many individuals and departments for years to come.

The planning group next must construct and implement a plan for how it will finalize a working document.

- The first step in finalizing the plan involves determining exactly who is responsible for each section of the long-range facility plan. After the plan has been broken down into elements and sections, the planning group determines who is qualified to perform each task.

- Someone should serve as the overall facilitator, orchestrating the various elements of the plan as it comes together and ensuring that all elements are related and well coordinated. The facilitator should identify each key player and clarify his or her role.

- The second step in finalizing the plan is for the planning group to collectively establish a document timeline. At a minimum, it should identify major milestones and deadlines to assure that the long-range facility plan is refined in a logical sequence, with each section building on and relating to the others.

- A proven strategy is to create an overall steering committee that convenes at regular intervals to provide updating, coordination, and accountability. For most steering committees, a typical schedule calls for a meeting every two weeks: long enough to get work completed between meetings but not so long that the project loses momentum. The facilitator or steering committee chairperson should be in charge of updating and maintaining the overall process schedule.

Prepare Building and Program Budgets

Next in refining the broad-scope idea is to begin assembling and constructing building and program budgets. This phase of the process requires someone who has professional knowledge of construction costs and how to assemble the needed kinds of budgets.

As you consider construction budgets, make sure there is a clear picture of what is and is not included in the cost estimates. Incidental or "soft" costs sometimes account for 25 to 30 percent of the total cost of a project. Create an itemized checklist that spells out who is budgeting which items. The checklist needs to deal with matters such as:

- Is landscaping a construction cost or a soft cost?
- Are file cabinets in the construction budget or in the equipment budget?
- Is the telephone system in the technology budget or in the equipment budget?

Printing costs, professional fees, bonding costs, and survey costs all need to be introduced into the budgeting process to assure a successful and complete project. Spending time and effort here can determine the project's ultimate success. Always help and query the person putting costs together as a way to assure that items are not overlooked and forgotten.

Consider projects' timing. Budgeting on school projects forces a dollar estimate to be made for a project that may occur two to three or even five to eight years down the road. Inflation has been relatively mild recently, but even as little as a 3 or 4 percent increase in costs could drastically alter the scope of a project.

If work is to be accomplished during the summer or if it's a remodeling project, it should be bid early in the year. Most construction projects need to start in late winter or early spring to leave time for furniture installation, staff move-in the following summer, and student occupancy in the fall.

Another way to make sure a successful project does not turn sour is to plan for contingencies in your building budget. Contingencies provide flexibility as details of the long-rang plan are fleshed out. They also provide fiscal security during construction to address delays, omissions, unforseen conditions and owner-requested changes to the project. All too often in the process of trying to maximize building projects and cut overall project cost, contingencies are severely reduced or removed altogether.

Reducing or eliminating contingencies — perhaps ones allowing for changes in technology or the way technology improvements might affect classroom configurations - from the budget would severely reduce the flexibility needed for negotiation during the project. By maintaining those contingencies, the planning group will have more discretion in making sure priorities in the

project do not get eliminated. Likewise, the inexactness of construction estimating, even for the most sophisticated contractor, requires budget flexibility.

Then, too, no matter how good your planning process is, the only thing guaranteed is that something or someone will change. Make sure that the agreed-on process can accommodate change without throwing out the entire long-range plan.

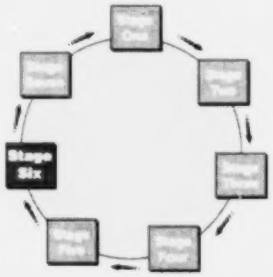
Keep in mind that long-range facility planning is part of a larger school-district reality. And that means planning ahead in a truly comprehensive manner.

- Giving too little consideration to staffing and operation can destroy even the most well-intended plans. Even decisions that affect curriculum only slightly may require double staffing.

- Building new facilities can be cheap in comparison to what it takes to heat and cool them. Most capital improvement plans provide money to construct or renovate facilities, but then provide nothing to operate them. Even a small elementary school building can consume more than $100,000 in utilities in its first year.

Finally, the planning group presents the full long-range facility plan to the school board for approval. The plans typically range in length from 30 to several hundred pages, depending on district size, the detail and scope of the plan, and whether the plan includes all supporting materials in appendices or includes only key points and serves as an overview. Once the plan is approved, the school district moves on to implementation.

Stage Six – Implement the Plan



The goal for Stage Six is to implement the long-range facility plan approved by the school board.

Once the plan is adopted, it is more important than ever to organize efforts to assure that the consensus building and support to date carry over to helping implement the plan in a positive atmosphere. If the plan is delayed or, in a worst-case scenario, not put in place at all, the negative fallout from everyone who helped develop it could be enormous. Even the best and most ardent supporters might lose interest or become naysayers undermining future planning attempts.

Determining Expectations of All Parties

Most people want to feel good about what they do and to be associated with successful and rewarding work. Quality and performance problems arise usually due to misalignment of expectations, not because a person chooses to work at a low level. Typically one party expects one level of quality or quantity of work

while another understands something else is expected of them.

The key here, as it relates to implementing any long-range plan, is for any party involved in implementing the project to have a clear and precise understanding of (1) the long-range plan and (2) what his or her role in that plan is. Any person involved in executing any portion of the plan needs to know and appreciate the history of how the plan evolved.

When it is time to implement a plan, many individuals who have not participated in the planning process will become crucial on a day-to-day basis to its success. A deliberate effort is required to educate everyone involved about the collaborative process of plan development and the reasoning behind all decisions. The explanation must focus on how results were reached.

Once everyone has a clear understanding of process and outcomes, the next step is to clearly define each person's role in implementing the plan. Each person needs to construct, in writing, either as a group or as individuals working with a committee chairperson or facilitator, a definition of his or her role in the project. They need to document who they will be getting information from and who they will be supplying information to; when milestones need to be reached; and what resources are needed to make the effort successful. As with many planning documents, the real value of documenting roles is in what is learned and clarified for everyone by going through the process.

An excellent way to make sure you are getting off to a good start on implementing your long-range plan is to hold a kickoff meeting to review everyone's roles and expectations and to clarify the timeline. Have all individuals involved submit their written descriptions of their roles in advance and circulate them prior to the meeting.

A few areas of conflict probably will need to be discussed and clarified. Better now than later! By requiring everyone to participate and document their responsibilities, there's a much greater likelihood of accountability and success.

Creating a Structure for Success

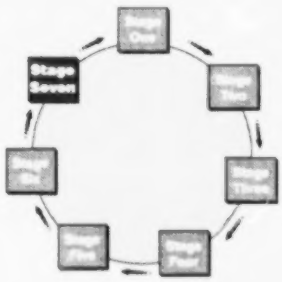
As role definitions begin to take shape, it will quickly become apparent that the group of individuals charged with implementing the plan needs an internal structure to maintain its direction and focus. Various organizational structures can work well. Whether it's a steering committee or a task force, the group's structure should be designed to facilitate the specific tasks determined by the long-range plan and to keep all involved individuals well informed.

A critical element to factor into the group's structure is a realistic view and understanding of the individual work styles and habits of the key players on the team. Some individuals who are detail oriented start feeling lost if the group structure is too loose and dynamic. People who take the big-picture approach can become uncomfortable if too much structure is imposed. The trick is to create a structure that accommo-

dates all the parties involved yet functions well.

Long-range planning, like comprehensive school district strategic planning, should be never ending. A standing long-range facility planning group can provide a constant source of motivation and direction to ensure the institution does not grow complacent. Regular meetings and retreats can help the group evaluate successes and failures and then direct or redirect efforts in years to come. At different times, the focus may be on one year, five years, or further into the future.

Stage Seven – Review, Evaluate, and Update (Closing the Planning Loop)



The goal for Stage Seven is to maximize your school district's return on the substantial investment it has made in creating a long-range facility plan. After all the hundreds of hours and many meetings, this last stage of planning can help establish the groundwork and direction for even greater success for your school district.

As demonstrated by the previous stages, the planning process is an evolutionary one. Stage Seven closes the planning loop and creates the mechanism by which your school district can maintain constant review, evaluation, and improvement.

Maintaining the Investment

A great amount of effort has been expended in creating the groundwork for the planning process, finding the right people to make it happen, and then getting everyone pointed in the right direction. Maintaining the planning process takes just 10 to 15 percent of the effort expended on creating the original plan.

The worst possible direction at this point is for your school district to put the results of the planning process up on the shelf to be reviewed in the next several years. Do not let that happen! Instead, capitalize on all the hard work and continue to maintain the structure and process.

A major benefit of maintaining school district planning over time is providing a level of continuity that assures stability and helps develop long-term buy-in throughout the school district. Maintaining the strategic planning process is similar to having a districtwide reinvention program in place, one that allows for directed and focused efforts toward actual goals.

Refining the Planning Process

No building or remodeling project is 100 percent satisfactory. There are too many factors outside everyone's con-

trol or that change on an hourly basis. But your district can enjoy the satisfaction and gratification of improving a process over time. Regardless of whether it is a planning process or a building project that is completed, it is always healthy to review and brainstorm the entire process once completed. Survey the planning group, preferably in a meeting rather than in writing, regarding:

- What worked so well we would do it again?
- What worked but could have been done better?
- What would we not do again?

With answers to these basic questions, you can reconstruct the long-range facility planning process from the ground up.

The goal here is to refine, not necessarily reinvent, the planning process. And if the seven stages outlined in this chapter were followed, it would be highly unlikely that reinventing the process would be necessary.

And now for a final word: For a planning process to remain successful and maintain wide public support and buy-in at its various stages, commitments must be maintained. Even the most understanding board member or patron will become disillusioned with the long-range plan if projects have to be altered significantly due to poor planning and lack of adequate resources.

As your planning group makes, and then later refines, its long-range facility plan, attempt to consider all possible ramifications. Make sure each and every commitment and element within the plan has a way to be realized. If done completely and thoroughly, the long-range facility plan will continue to build a strong bridge of credibility among members of the school board, administration, staff, school district patrons, and business community.

Chapter 3: Working with the Architect

You have been given a wonderful opportunity to design or remodel a building that will prepare children for the 21st Century and serve the community in ways as unlimited as your creativity.

The prospect is challenging. Mistakes and oversights in design, once finalized, cannot be erased like a mistake on a multiple-choice test.

Selecting your architectural team calls for care and effective communication. The architect's goal should be to meet *all* the school district's ("owner's") requirements. The process begins with a conceptual idea, which will be reworked as a result of discussion, research, and municipal code requirements. Space will be refined several times until the building's schematic design begins to take on an architectural personality.

The investments in time and money will pay off the first day students pour through the doors of a new or remodeled school. When the building provides the space and opportunities for the activities you have foreseen, you will see that time dedicated to detail and communication was well spent.

The process of designing a school requires several stages. The initial stages involve selecting an architect; establishing a structure for decision making within the school administration and community; writing an educational specification, the "map" for a future design; performing cost estimates; and hiring a technology specialist.

Those steps are the groundwork. Next, the project moves into more technical phases of architectural services: schematic design, design development, construction documents, bidding and negotiation, and construction. This

chapter attempts to provide basic information to help smooth the way.

Throughout the entire process, two words should be kept in mind: "flexibility" and "future." Education and technology are ever changing. The new building must keep up with the times. With forward thinking, the school district and architect can successfully design a building that serves children and the community well into the future.

Selecting an Architect

Selection of the architectural firm is central to success. The architect with significant experience at all levels of education, from elementary through college, will bring problem-solving expertise. Look specifically for one with experience in designing schools well-equipped with technology. The experienced architect won't repeat ideas that didn't work the last time and should be able to foresee some of what the future will bring to the school environment. The ability to adjust to those needs and changes is critical to the facility's success.

The architectural firm should be retained early in the feasibility process. It can identify overall program weaknesses and oversights and can explain possibilities and limitations as it investigates the project and potential building sites. An architect familiar with and specializing in school design can help the district select a site that is conducive with school requirements. Geographic features have an impact on the orientation, location, design, and cost of the building.

Decisions at this point will affect the receptiveness of new students and parents who rotate into the building each school year. The space should be inviting and comfortable, help newcomers find their way, and ease circulation of people throughout the building.

When selecting your architect, consider all the qualities required to get the job done. The definition of architecture as the blending of art and engineering into a built form points out the requirements of talent in both engineering and art. The architect also must be a strong communicator and facilitator to be effective. Throughout the design process, the architect must communicate clearly with the entire design team and the client/owner representatives and school personnel, reaching consensus on design issues.

Finally, find an architect who understands that schools are built to last and must be flexible and as easy as possible to maintain. Schools of the future will inherently have more maintenance issues to contend with due to the interior construction required to maintain flexibility. A quality facility will stand the tests of time and of use by students and staff.

Seek an architect with the above experience, skills, and understanding. Sit down and talk with candidates and pay special attention to their plan for a communication process. And if possible, visit some of the technology-equipped

Pro's & Con's of Educational Specifications

PRO's:

- **Allows the design team to be aware of owner's wants and desires without all members participating in the interview process.**
- **Establishes a minimum standard from which the design is evaluated.**
- **Creates a document that the owner may use for future equipment/furniture purchase.**
- **Provides consultant team (mechanical/electrical/ plumbing) information to properly design the space.**
- **Alleviates costly changes during construction.**
- **Allows input from the users of the space.**
- **Provides means for obtaining input from key staff and instilling sense of ownership.**

CON's:

- **Takes time.**
- **Requires update if changes occur during design phase and notification of change to all parties.**

schools your top candidates have designed before making your selection, in order to make sure your architect will be able to appreciate your needs and is willing and able to fulfill them.

Creating Educational Specifications

Educational specifications – also called ed specs – form a picture, in words and graphics, of the spaces within a facility and establish a minimum standard for project design. They come in three types: graphic, written, and combination graphic/written.

Three levels of decision making are required in establishing educational specifications: staff, steering committee, and school board. The steerimg committee is the primary decision-making body. Typically, it is made up of the superintendent, assistant superintendent, director of technology, director of curriculum, a school board member, school principals, and parent volunteers. The makeup of the committee varies among school districts. It must be formed as early as possible to ensure good communications from the start.

Field Trips

Members of the architectural team and individuals selected by the steering committee should select and tour facilities similar to what your school district and community wants built. Your investigators should evaluate facilities based on pre-established criteria and

document the findings. They should ask the users of these facilities for their opinions and experience regarding what works, what doesn't work, and what they would never do again. This kind of information will be invaluable to your steering committee and the architectural team.

Interviews

The architectural team must learn from school personnel the requirements for each space. Department heads and instructors who will work in the facility must elaborate on the curriculum and dynamics that will take place in a given environment. In addition to furnishing crucial information, staff participation in design planning will promote positive "buy-in" for the project.

Personal interviews are one approach. Individuals who are interviewed should first be enlightened as to why they are feeding facts and data to the interviewers and must be made to understand the consequences of what they say. Critical programming dates of each phase of facility development should be explained so that interviewees can grasp the importance of providing correct information about their wants and needs that will be incorporated into the design. Likewise, staff must realize that the process that architects go through is very complex.

Architects typically will request very general information at first and then ask for more specific details as the project evolves. An architectural team that is experienced in school and educational design will be adept at guiding staff members through interviews and collecting pertinent data.

Questions often will prompt discussions that generate crucial facts and details. A typical set of questions that might be asked about a network center are "What about locking and security measures? Who will be cleared to have access to the security information?" All information gathered should be kept in a binder for future reference. It will form the basis of the educational specification.

To aid the interview process, or as a substitute for it if the school district chooses not to allow staff opportunity for direct communication with the architect, the architectural team can provide a questionnaire for staff members. As a pre-interview tool, this helps staff to begin thinking about design issues before they are called on to express their needs and wants.

When school personnel opinions are likely to differ, the architectural team can propose solutions to get consensus. Reaching consensus avoids the dilemma of every teacher expecting a different layout. Other rewards include more cost-effective design and flexibility for instructors, plus ease of relocating classes as needs change.

Educational Specification Outline

I. Department Name

II. Department Direction Statement

III. Name of Functional Space

- A. Number of spaces required
- B. Activities within that space
- C. Capacity
  1. Student capacity
  2. Staff capacity
- D. Location and design considerations
- E. Furniture and equipment in Contract
- F. Furniture and equipment provided by Owner
- G. Special requirements
  1. Material selection criteria
     a. Flooring
     b. Walls
     c. Ceilings
     d. Acoustical considerations
     e. Doors
  2. Mechanical criteria
  3. Electrical criteria
     a. Lighting
     b. Public address system
     c. Telephones
     d. Electric clock
     e. Intercom
     f. Dedicated circuits for computers
     g. Lighted display cases
  4. Plumbing criteria
  5. Communication
     a. Public address system
     b. Intercom
     c. Telephones
     d. Computers
  6. Technology criteria
  7. Safety criteria
  8. Security criteria
  9. Other documentation
     a. Overview of project
     b. Site information
     c. Tour notes
     d. Owner's goals
     e. Project goals
     f. Net square footage to gross square footage ratios

It is the architectural team's responsibility to provide a project that meets the staff's wants and needs within budget. In order to do this, it is sometimes necessary to deviate from the educational specification. Such decisions should be documented thoroughly by both parties and copied to each for their review and record.

The Document

The outcome of the interviews is the actual educational specification, a tangible document that will guide formulation of the building schematic design. This is a written account of the educational philosophy and activity requirements of the building and the site. In the design of spaces other than schools, architects refer to this as a building "program." The architect will team with consultants – structural, electrical, mechanical, and plumbing engineers – and any specialists required to read this "map" and end up at the final destination: an "everything-you-ever-dreamed-of" (and can afford) building.

Design Process

Once the educational specification is complete, actual design begins. This is where the written information is translated into a graphic form. Keep in mind how critical equipment and technology affect the design of the space. Certain equipment in a room can have a drastic impact on space requirements, especially if those requirements are dictated by building codes.

As noted earlier, a guiding principle of architectural design is that "form follows function." For school facilities, this tends to mean that *how* teachers use a space determines *what* the design for that space should be. An architectural team that is sensitive to this and to the educational process will incorporate all the needed requirements into a space yet also aim to maximize future opportunity.

To do this, a building must be appropriate in size and scale to accommodate equipment, activities, and people. Those factors dictate different floor surfaces, acoustics, sound, and materials. Relationships between overlapping or related functions determine certain design results.

A technology consultant should be involved early in the design process – preferably before completion of educational specifications — to take the district's collaborative technology planning efforts and make them actually work, accommodating current and future technology into the design. This same consultant can assist school leaders in discovering different approaches to the technology program, as discussed in following chapters. It is best to choose a technology consultant who is not affiliated with a company that would benefit from specifying any particular hardware/software product.

To find a good technology consultant, check with other school districts for any who have served them well. Your architect should be able to make

recommendations of technology consultants. Another source is the Council for Educational Facility Planners International (8687 E. Via De Ventura, Suite 311, Scottsdale, AZ 85258, 602/948-2337), which publishes a directory of architects, construction managers, planners, engineers, manufacturers, and technology consultants. Note that those listed are charged for the privilege and that only a relative few are included there.

All decisions and design changes should be documented, especially if they differ from the educational specifications.

Architectural services have five phases:

- **Schematic design**
- **Design development**
- **Construction documents**
- **Bidding and negotiation**
- **Construction contract administration**

The following italicized descriptions of these phases are quoted from the noted sections of *The Architect's Handbook of Professional Practice, Volume 2: The Project, 1994 Edition* published by The American Institute of Architects, which has granted permission for their use here.

Schematic Design
(Design Phases Section 3.63, page 638)

Schematic design establishes the general scope, conceptual design, and scale and relationships among the components of the project. The primary objective is to arrive at a clearly defined, feasible concept and to present it in a form that achieves client understanding and acceptance. The secondary objectives are to clarify the project program, explore the most promising alternative design solutions, and provide a reasonable basis for analyzing the cost of the project.

Design Development
(Design Phases Section 3.63, pages 643 and 649)

During design development, the design team works out a clear, coordinated description of all aspects of the design. This typically includes fully developed floor plans, sections, exterior elevations, and, for particular areas or aspects of the building, interior elevations, reflected ceiling plans, wall sections, and key details. Often these become the basis for the construction documents to follow. The basic mechanical, electrical, plumbing, and fire protection systems are accurately defined if not fully drawn. No major issues that could cause significant restudy during the construction contract documents phase should be left unresolved.

The deliverables of the design development phase are similar to those of schematic design; drawings and specifications that fix and describe the size and character of the project, as well as any recommended adjustments to the preliminary estimate of construction cost. The design development phase usually ends with

formal presentation to, and approval by, the owner.

Construction Documents Organization and Content
(Construction Documents Section 3.81, page 703)

The construction documents are the written and graph documentation prepared or assembled by the architect for communicating the design and administering the project. Their organization and content reflect the needs of the project. Typically, the construction documents include:

- *Drawings, documenting the architectural, structural, mechanical, electrical, civil, landscape, and interior design of the project.*
- *Specifications, outlining the levels of quality and the standards to be met in the construction of the project.*
- *Contract forms and conditions, including the form of agreement to be used between owner and contractor; forms for any bonds and certificates; and general conditions outlining the rights, responsibilities, and duties of owner and contractor as well as others involved in the construction process (including the architect).*
- *Bidding requirements, including the information and forms for bidding.*

Make Sure These Get Included in Your Cost Estimate

- **Contingency allowance.**
- **All "soft costs": printing, design fees, testing, surveys, soil borings, furnishings, etc.**
- **Site development costs.**
- **Municipal fees for building permits and utility connections.**
- **Contractor's fees.**
- **Technology infrastructure and equipment.**

For officials in charge of tax dollars, no subject is as touchy as being accused of wasting money. If a promise is made, it must be kept. If a bond issue gave a specified scope of work, it must be met. Cost estimates should be performed at milestone points in each phase of the project. (This is usually part of standard contract language.) Cost estimates tend to start out in a general way and become more specific as the project continues. The American Institute of Architects defines design cost estimating (Construction Cost Management Section 3.73, pages 690 and 691) as follows:

Successful cost management depends on sound estimating skills. Estimating involves two basic steps: quantifying the amount of work to be estimated and applying reasonable unit prices to these quantities.

While there are many estimating approaches and systems, they generally fall into one of these basic categories:

- *Area, volume, and other single-unit rate methods*
- *Elemental (assemblies and subsystems) methods*
- *Quantity survey methods*

Bidding and Negotiation

After selecting a contractor or construction manager for the project, design decisions still need to be made. Inevitably, the bidding and negotiation process leads to proposed substitutions or detail modifications to achieve cost savings or to simplify the construction process. Some of these are usually accepted and then must be integrated successfully with the remainder of the design.

Construction Contract Administration (Section 3.92, page 755)

The construction phase brings all the predesign, design, documentation, bidding, and negotiation services to realization. While one or more building contractors assume responsibility for the construction work, architects remain involved to:

- *Observe the construction work for conformance to drawings and specifications*
- *Process the results of construction tests and inspections*
- *Evaluate contractor requests for payment*
- *Handle requests for changes during construction*
- *Address and resolve claims brought by the owner or contractor*
- *Administer the completion and closeout process for the owner*

Even after construction begins, the need for design-sensitive decision making continues. For instance, construction documents might require interpretation or field conditions and other problems might force design changes. Or, confronted with the realities of the project, the school district might request design changes.

This listing of school-design phases briefly describes the process that an architectural team goes through to complete a project. Design is a continual process, and it is exceedingly important that, at the end of each phase, the architectural team make a presentation about what has taken place and evolved so the entire planning group is fully aware of where the project is in meeting its objective. If the objectives are met, it is helpful for the planning group to provide the design team with written authorization to proceed to the next phase.

Flexibility

In the real estate profession, the three key elements of a piece of property are "location, location, location." In the design of schools, three key elements that school boards want incorporated are "flexibility, flexibility, and flexibility."

Technology has made that truth more prominent in educational environments. Every month, new products are introduced that can have hundreds of uses in classrooms. A variety of learning environments are needed for all grade levels: small groups, traditional classrooms, and gathering areas that can accommodate multiple classes.

Furnishings, Equipment, and Space Planning

As great as a building appears in design, people cannot occupy a facility without appropriate furnishings, storage, and equipment. That's why the architectural team is likely to include a space or interior designer who will develop room layouts to work with the furnishings and equipment.

The space designer is the one who keeps in mind the purpose of the furnishings and equipment. For instance, although a cafeteria layout with tables specified to seat 12 students each might look perfect on paper, it would be an unwelcome surprise to discover that the selected tables are unable to accommodate 12 standard lunch trays.

While assessing actual furnishing and equipment needs, any previously overlooked or omitted requirements need to be addressed as well. If the educational specification states a "multi-use" area will be used for meals, further translation shows that storage space and square footage is required for tables, chairs and, when they are not in use, storage dollies. If the cafeteria chairs stack 40 high, the square footage is calculated to be sure the dollies can store 40 chairs. Also checked: that 40 chairs stacked on a dolly can clear the room's 7-foot doorways. A great many such issues must be thought through and determined during design development.

Placing Computers and Electrical Hookups

Computer equipment no longer is corralled in one or two rooms or labs at a school. Almost every area has immediate or future need for cable hookup. This includes administration areas as well as classrooms. Even traditional vocational education classes are being transformed into industrial technology laboratories.

Distance learning technology is linking schools with universities, city libraries and governments, hospitals, newspaper offices, and other schools. A class offered at one school can be offered district-wide and beyond. A lecture or training session offered at a college 50 or 1,500 miles away can be brought into a school classroom in real time. Student musicians can play along with their peers and professionals worldwide.

To provide these powerful opportunities, schools must carefully coordinate wiring entries with activities and placement of furnishings. Immediate needs must be considered together with future opportunities. Artificial and natural lighting are additional concerns, as they affect proper placement of computer and television monitors.

Flexibility is key to computer furnishings. A smart option to typical built-in casework is adjustable and ergonomically designed furniture. Desks, chairs, carts, and tables can be mobile for ease of relocation and adjustable to accommodate various body sizes. Furniture

must safely support expensive and sometimes heavy computer hardware and video monitors and should provide protective troughs for the wires and fiber optics. The furnishings industry is very progressive in researching needs of today's market, and quality manufacturers provide many solutions for the ongoing flexibility requirement.

Specifications for Furnishings

Specifications for furnishings and equipment are just as important as construction documents. If written correctly and with intended use in mind, the specifications will save money and time and will protect the district against the problems and errors that poor decisions and inferior manufacturing techniques can cause.

School districts rarely have on staff an individual who can dedicate time and expertise to coordinating furnishing and equipment specifications. Dealing with staff placements and working with schedules and curriculum generally is plenty for school administrators to handle. The architectural firm can develop the specifications and follow through on all stages of the furnishings and equipment, assuring that equipment will be purchased within budget, will work, and will fit.

The specification writer's responsibility is to research and select appropriate furnishings and equipment and to assure that they meet the requirements of the Americans with Disabilities Act (just as the building specifications must meet ADA requirements). That individual should be included in the project from the beginning and know all intended functions, so that the specification will reflect those requirements. Ideally, building design and the furnishings/equipment specification are developed simultaneously to obtain a unified project.

Budget is an issue no school board can ignore. Bond money or other sources of financing furnishings and equipment always have a dollar limit. Exercising competitive bid procedures will keep prices at fair and justifiable costs. Every state has regulations that affect how furnishings and equipment can be bid, and each school district will add requirements or restrictions for procuring products and services. Laws that impact schools and other state-supported agencies in regard to accessing state and federal purchasing agreements are changing. Confer with your architectural team to ensure which purchasing avenue is most advantageous.

Your architectural team also can provide follow-through during the furnishings and equipment delivery stage. It is imperative to confirm that equipment has arrived at the site and that it is installed in satisfactory condition. Billings can be directed to the lead person on the architectural team, who can approve pay requests just as he or she approves all pay applications dealing with construction. This saves the school district the sizable additional work of documenting arrivals, checking for damage, and managing invoices. It also protects the district from possi-

Top Ten Nuts and Bolt Issues

1. **Size cooling systems to allow for heat generated by electronic equipment.**
2. **Provide lighting designed to eliminate glare on computer screens.**
3. **Show each piece of equipment planned for each room and its location for proper placement of power and data outlets.**
4. **Provide surge protection.**
5. **Design with security in mind. Minimize doors to the outside.**
6. **Locate video equipment to avoid being exposed to window glare.**
7. **Locate trees a minimum of 15 feet from the building to prevent window and roof access.**
8. **Mount all exterior lights a minimum of 12 feet above the ground to avoid vandalism.**
9. **Design long distance learning labs with acoustics that allow proper voice clarity. Minimize mechanical systems noise. Use wall treatment to minimize echo.**
10. **Separate the bus loading area from dropoffs that are used by parents and staff.**

bly overlooking damage or the delivery of incorrect products or quantities and then issuing payment inappropriately. As the lead on the architectural team and the space designer coordinate completion of the building construction, it makes sense to use their services for total project coordination.

In addition to sharing its knowledge of furnishings, equipment, and necessary tasks, the architectural team can enhance the environment by merging quality building finishes and furnishings with color and style. An experienced team should be able to specify products that will last long and age gracefully.

Nuts and Bolts Issues

The architect and educator must collaborate on nuts and bolts matters such as the building's mechanical and electrical systems, security inside and out, and technical issues such as room acoustics. The architect will coordinate with other engineers on these issues. Once the contractor hands over the keys to your new building, it is your responsibility to maintain the systems. Keeping that in mind, know your limitations. Sophisticated mechanical and electrical systems may seem nice on the surface, but the more sophisticated the system, the more maintenance it is likely to require. District personnel assigned to maintain these systems must know how to keep them working properly.

Quality Control

Traditionally, quality control has been considered a defense mechanism, catching errors and looking for deficiencies in the design drawings. Instead, quality control should be – and is becoming in practice – an attitude. The entire design team should be thinking of quality control from start to finish.

When the architect reviews the design with your steering committee at the completion of each phase – schematic design, design development, and construction drawings – look at each of these sessions as part of quality control. Review plans carefully with staff, actually sign and date each review set, and save the drawings for reference. Later in the project, ask that the entire design team – architects, engineers, and tech-

nology consultant – be present to review plans.

One new technology that holds promise is the virtual reality walk-through. This technology will allow you to have the sensation of walking through a building in three dimensions via a computer screen prior to any construction. Many potential design flaws can be avoided this way.

Schools as Community Centers

Schools are part of the community. Many voters in a district don't have children in school but actively use facilities through community programs.

Plan for community use of the facility. Design gymnasiums, theaters, and media centers so they can be accessed easily by the public, yet zoned off from the rest of the building to provide security.

Consider merging a business, such as an office supply store, a computer store, or a copying service, into the school building. Students can see first hand how a business operates, and together with administrators they can gain immediate access to services and supplies. Or how about an onsite restaurant to provide students with food management experience and meals?

Your local parks and recreation department could partner with schools to provide your community with outdoor activity/educational facilities that could be used not only by the students but by the community as well. Your district and parks and recreation department could combine forces to provide and maintain facilities accessible to school sites. Both parties could work together to provide sports facilities and outdoor learning areas and share maintenance and funding.

Some community colleges and school districts are forming partnerships that allow the colleges to use district facilities for adult education programs. The colleges gain the use of the buildings, and the district receives income generated through rental/lease agreements.

Local theater groups could partner with districts to provide theaters and auditoriums that meet the needs of both parties while sharing the costs.

Local community libraries could open branch libraries at schools in lieu of them building separate facilities that require additional funds.

Consider collaborating with senior citizens to provide them opportunities to volunteer in the school district. This is not a new idea, since many senior citizens already volunteer at many government facilities and hospitals. This can help students to learn from their elders and gain respect for them. The senior citizens can benefit by participating in a thriving group of young people, closing the generation gap. And the district gets an opportunity to show senior citizens – who frequently oppose bond issues – why funding is needed to provide a quality education in a changing world.

Many other opportunities are possible. Each district and community must evaluate its own needs and decide whether and how school buildings could be used effectively in multiple ways at minimal expense. Keep in mind that it is easier to get community support with community involvement in schools.

Renovation and Preservation

Not all school facilities projects are new construction – nor should they be. School districts often must decide which is wiser – renovating an existing structure or building from scratch. To help in making the decision, the school district should:

- Conduct a facility assessment and thoroughly evaluate the building to make sure it is worth renovating. Many renovations end up costing more than a brand-new facility. All systems must be checked to ascertain their condition and to estimate remaining performance levels and life expectancy. Determining these factors helps justify the school district's decision to renovate or to build a new facility instead. It also helps in developing the project budget.

- Refer to the facility's asbestos survey or have one performed. Any asbestos that new construction will disturb must be removed by a certified specialist. The school district must budget for the removal and allow adequate time for the contractor to complete the work.

Facility Assessment Checklist

- Adequate space
- Lighting
- Mechanical systems
- Power sources/capacity
- Structural soundness
- Flexibility
- Accessibility
- Security
- Feasibility
- Demographics
- Life safety
- Education equipment

- Determine if the building meets requirements of the Americans with Disabilities Act. An architect can determine which modifications are needed to comply with ADA. Many modifications, such as ramps, elevators, accessible bathrooms, and new fire-alarm systems may be needed to meet federal standards.

- Set a budget early so the planning group and the architectural team can develop a plan that meets your needs. Develop a timeline and determine phasing for the project. The construction sequence is pivotal in knowing how the facility can be used during construction and when the renovated space can be occupied.

- Develop a construction contingency of at least 10 percent in the budget. Do not reduce this during design! Your planning group may be tempted to whittle down the contingency as a way to increase space or add items

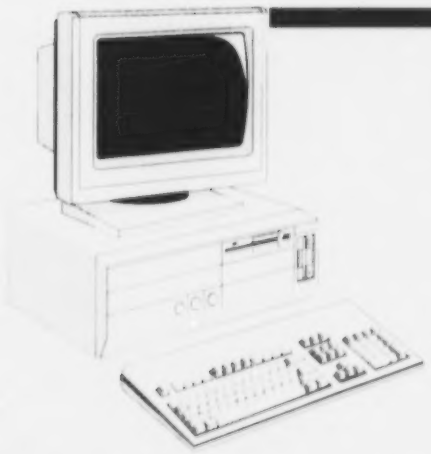
in the design. But it is critical to maintain the contingency because of the unknowns found during construction. Opening ceilings and breaking into existing walls can uncover many unforeseen surprises – often with high costs attached. The contingency also can help if the project runs into delays during construction.

- Include costs for temporary facilities, moving expenses, and change orders in the budget. Develop a mind set to allow for changes as the work progresses. Besides possibly discovering problems that were not initially visible, you may encounter delays that force a change of materials or construction methods, which in turn cause more delays.

- Be prepared for the "frustration factor" of renovation work. It is important to educate everyone involved — the administrative staff, maintenance personnel, teachers, students, parents, and other building occupants — about the work in progress and the many inconveniences that are likely to occur during construction. A quality contractor with pertinent experience in remodeling facilities is absolutely key to the success of a renovation.

- Occupancy during construction will be a trying experience. Issues that must be dealt with throughout the project include students mingling with construction crews, construction noise, air quality, materials storage, and safety precautions for individuals covered under the contractor's responsibility.

Good communication, determination, and patience are what makes a renovation project successful.



Chapter 4: Technology, People, and Spaces

Trying to design a technology system without knowing what activities will take place and where is like trying to design a highway without knowing the size of the population or the habits of people in cities along the route. While it is likely that the pavement will reach from one end of the road to the other, the on and off ramps might not be at the right intersections.

This chapter examines instructional technology at the high school level and briefly at the middle school and elementary school levels. From media centers to specialty classrooms, it looks at space design based on the capacity or limitation of the technology hardware involved, the people who use the technology, and the space in which those interactions take place.

Maybe because it sounds, on the surface, like an easy task to design information technology spaces and systems, "trial and error often play too large a role in the process," says Stephen Friedbender, FAIA, President of HMFH Architects (Cambridge, MA). "Many districts," he says," wait too long before making a commitment to plan for technology. Often those decisions don't start until after the construction bids are in."

That is precisely why a technology consultant is essential in a school district's planning and must be involved early in the process. A competent, experienced technology consultant acts as the interpreter who ensures that current and future learning occur as specified by the district's curriculum and technology plans, and that flexible and future potential infrastructure, systems, and spaces are provided for that purpose. In addition, early coordination between the technology consultant and others, such as the electrical engineer, acoustics and lighting designer, and interiors/furniture designer, is essential.

Overall, the way to prevent abandoned or nonfunctioning school technology

investments is always to consider three essential elements:

- What
  What is the technology?
- Who
  Who will be using the technology?
- Where
  In what areas of the school building?

"What" (What is the technology?)

All technology has a given set of variables that determines how and where it can be used. Video cameras, for instance, have a given focus range. That focus distance coupled with the size of the production room determines which shots are possible. A standard VHS camcorder, for instance, needs a longer distance to focus than an 8-mm camera. Trying to provide for a three-camera setup in a video studio that is less than 10 feet by 10 feet with a standard camcorder means that a good long shot of a presentation panel just can't happen.

To plan spaces and activities correctly, it is absolutely necessary to know the initial equipment to be used and to anticipate future equipment purchases and applications. Often, technology is integrated into a curriculum – and its space – in phases. The technology consultant can help both instructors and architects plan activities and spaces accordingly.

Space designers must be aware of the spatial requirements and functional limitations of selected hardware. All hardware has a given "footprint," or required space. A desktop computer has a larger footprint than an under-the-desk tower style computer. A multimedia computer, complete with speakers and input devices, may have an even larger footprint. If the hardware moves (on a camera dolly, for instance), it might have a "rotational" footprint or requirement. Be sure to consider not only how much actual room the item takes up when it is in place, but also how it will function or expand in that space.

"Who" (Who will be using the technology?)

The second element to be considered is who will be using the technology and how they will be using it. If the technology is to be successful, real people's "footprints" must be added to the design equation. While a footprint for a hardware item is a fairly easy measurement to determine (just grab a tape measure), the human element complicates matters.

Asking the following questions about planned technology early in the design process helps ensure that both systems and spaces meet students' needs:

- Will this be an item that only one person needs access to? Is this always the case?
- Will the user bring his or her own materials, hardware, books, handbags, and/or other items?

- Will this system or hardware be used in a formal class setting? If so, how many students will be in the class?
- Will there ever be collaboration with another person or group?
- Will collaboration require special, flexible furniture that enables easy rearrangement?
- Will this technology area need to be in proximity to any other area for maintenance, support, supervision, or device sharing?

"Where" (In what areas of the school building will technology be used?)

Even when the hardware is great and the space is adequate, it takes plenty of people (trainers, teachers, and media specialists) to assist, answer questions, and support students and staff using technology. The systems and spaces need to be easily supported if they are to be used to their fullest capacity.

This means, for example, that if a teleconferencing room is used on an irregular basis and needs setup or teardown, special support, or security, it may need to be located in or near the media center. There, media specialists can assist with hardware functions while having quick access to any needed curriculum information sources.

If, however, a technology is integral to scheduled class activity and curricular requirements, it needs to be placed in or near the classroom where it is needed. For instance, if Internet projects are required as a regular part of the foreign-language curriculum, it only makes sense to provide Internet access in foreign-language classrooms.

In another important example of the "where" question, it usually is best to place school library/media centers at the centers of their buildings to facilitate access for all users to resources. There are architectural advantages as well. Library/media centers generally have high ceilings – for aesthetics, noise reduction, and high natural light that reduces glare – which perform more effectively at the center of a structure.

Library/Media Centers: Changing Roles, Changing Spaces

Libraries are not what they used to be. Today's high-school library/media centers are interactive, providing instantaneous access to information. Using the Internet, students are able to move beyond the confines of the center's walls. Modern, versatile networks allow them to consult online catalogs, chat with experts at remote sites and, generally, have access to information and materials not available in classrooms and libraries of the past. No longer confined to print media, students now can send and receive data and video images globally.

The world these students are preparing to enter requires a new kind of savvy: knowing how and where to find information; whether that information is

accurate or biased; when and how to merge information; and the most convincing way to present original work. Their potential success depends on these skills. It is in media centers that students should be able to find the most innovative information system connections, ones that allow testing, trial, and exploration of information acquired as part of their school learning experience.

For these reasons, school facility and technology planning involves a major rethinking of the roles and spaces represented by older, more traditional library design. Media specialists should be encouraged to use the planning process as an opportunity to challenge current assumptions about service functions, roles, and spaces – not only about where they function, but also about how and why they function.

Spaces and roles are blurring, however, with technology's ability to share and distribute voice, video, and data within a building, between buildings in the same school district, among school districts, and even globally. The media specialist must become more of a systems and instructional expert, and the classroom instructor must become more of an information access expert. And media centers and new media spaces will play a greater role not only in the teaching process, but also in the production process.

Even before an architect is hired, there should be a clear and articulated concept of how the rest of the building will function in relation to the media center. If everyone agrees that having access to all information at every desktop is more important than supplying certain resources at particular locations, there are design implications. If your architect or consultant doesn't seem to appreciate or understand the changing role of electronic information access and production, you need to find ones who will. This is an important issue with long-range design implications.

The High School Media Center of the Future

General Considerations

Knowing the components of media centers, including media-production areas, is key to understanding what media centers can become. Media centers have always been people places. Making those spaces as congenial as possible – while remaining flexible – remains of utmost importance.

Planning for flexibility mandates that media centers have as few internal walls as possible. The corresponding lighting pattern must be just as flexible.

Libraries traditionally require two types of lighting: general and task specific. While this remains true, the infusion of technologies into media centers creates new circumstances and rules for lighting needs. As an example, a diagonal pattern for ceiling lighting offers flexibility by allowing for good illumination no matter how the library stacks are arranged or rearranged – or even if they no longer function as stack areas. Running the lighting down the stack aisles definitely would limit future

design options. Similarly, placing diagonal ceiling-lighting installations on separate controls also helps with creating special lighting areas.

Making use of natural daylight in reading areas is a longtime tradition of library/media center design, and deservedly so. Yet also consider that while relying in part on natural light for daytime reading and activities works well, additional lighting will be needed if the media center is open for nighttime activities. Even if the facility does not have regular evening hours, more than likely there will be after-work parent open-houses and meetings of outside groups there in the evening.

Consider placing classroom areas in more controlled corners of the media center and making use of banked fluorescent or incandescent dimmer systems. If someone wants to use a portable projector for a presentation in one of the classroom areas, it will need to be darkened. Being able to control ambient light for that presentation or for other electronic functions will be important.

If your school district is renovating a media center space, conduct a photometric study to determine current glare levels. Ask your architect or technology consultant for advice on how to schedule this service. Many manufacturers offer photometric data on floppy disks, allowing the architect or consultant to try out several options for your site.

Lighting is one area that is typically outside of building code requirements

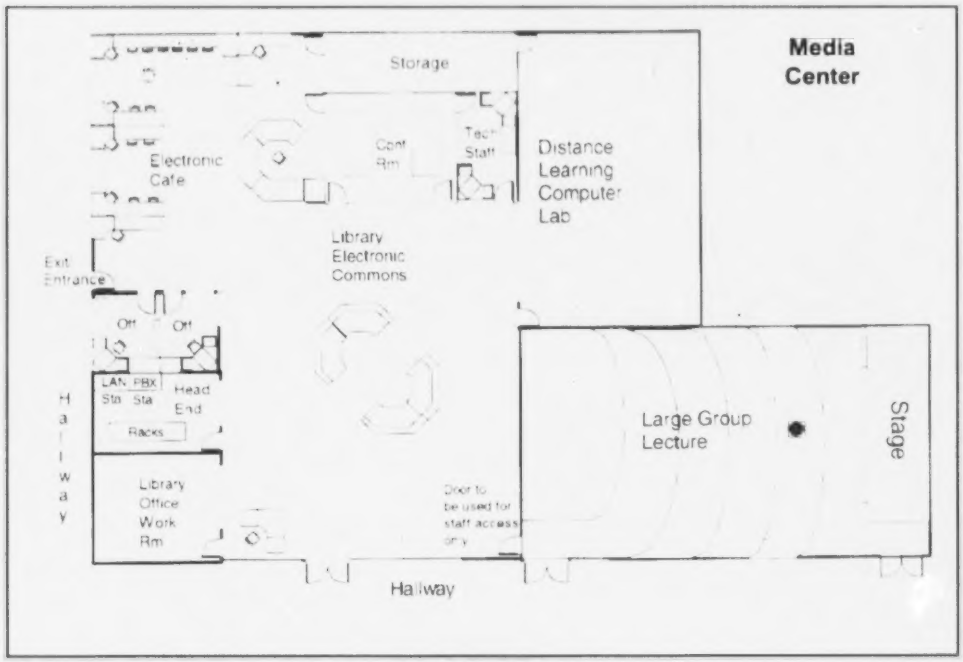


Diagram 6-1

and, as a result, can be overlooked in building project budgets. But proper lighting in a technology-rich environment is critically important. If it is not considered initially, it will have to be considered at a later, more costly date. Do it right the first time.

Color schemes that correlate with lighting levels also can make a big difference, especially when combined with comfort and flexibility. As corners or spaces that currently support reading areas might well become computer sites or telecommunications corners within a few years, coordinated color choices become important, too. Grays, blues, and similar hues help reduce and absorb glare. Natural colors lend themselves best to video transmission.

A few other design thoughts: Muted colors, wood, and well-designed and constructed furniture will function well into the future and look good in the process. Carpet and upholstered furniture help to control sound relay and transmission.

Be sure to designate all rooms and spaces in the media center – even current storage areas – in the initial plan for voice, video, and data cabling. Reconfiguring transitional spaces should not require installation work. If the basic space arrangement can't be changed over a long weekend, it is not well planned.

Calculating Spaces

It's true that every penny saved in footage and space is one more penny that can be applied toward internal systems such as air quality, acoustics, and computer networks. But don't assume that the movement of more and more material from bookshelves to online databases means a school needs less space for its media center.

People still need comfortable spaces in which to gather and use information. And today, using information extends way beyond jotting down notes while sitting at a library table and flipping through tomes on a term paper topic. Given the proper technology, today's learners have vast new research and presentation options.

A high school media center should address the needs of a techno-age student who wants to be able to create, receive, and apply every kind of information in a dynamic yet friendly setting. A media center with a production studio, head-end/control room, distance-learning classroom, multimedia-presentation lecture room, and to-the-desktop voice, video, and data bi-directional system is so valuable that the issue is no longer whether to design it into the school space but rather where to place it for maximum benefit. Concomitant staffing issues include questions of who will monitor and maintain these facilities and who will help students and faculty integrate the technological capabilities into the daily curriculum.

There are two ways to go. High-tech elements either are placed throughout the building, which requires hiring additional staff to support them, or they are placed in centralized areas where professionals versatile in managing them

already exist. For most school districts, placing high-tech spaces in or near a library/media center not only makes budget and space sense; it also makes program and curriculum design sense.

As noted earlier, determining the size for these spaces depends largely on how much room the technology devices take up and the ways in which people will interact in the space. Usually, student interactions depend on the following factors:

- Is it a scheduled class activity? Will only the same 20-25 students be using this space and these technologies during a scheduled time?
- Will production projects be more flexible and responsive to individual students or to small groups that need to create projects on a random basis?
- Can the budget support multiples of the same equipment, or will the equipment be shared between production locations (television studio, editing rooms, and computer multimedia lab)?
- Will pictures, sound, video, or graphics need to be transmitted to or from desktops, to the control room for building distribution, or to the community at large?
- Will trained staff members be available full time to teach, assist, and advise students creating productions or will the staff members simultaneously be responsible for other media areas?
- Will initial production activity take place in a linear (video) editing room and later activity in a nonlinear (computer based) lab, requiring a shift from place to place? If so, will the move happen physically or electronically?

To answer these questions takes an understanding of human interactions, the technologies to be used, and the complex systems designed to distribute signals from a studio. A technology consultant can be helpful here.

Most facility plans make the new breed of school library/media centers the home of their television studio, multimedia production lab, student/staff production area, computer training room, head-end distribution control room, information commons area, and editing facilities. Understanding how each area relates to the others helps define overall media center space and design relationships. For example, consider whether these spaces have common or shared equipment needs, cabling runs, electronic capabilities, and people supervision and assistance concerns.

Head-End Room

The electronic heart of it all is a media center's head-end room. The head-end room can be described as the electronic start, stop, and flow location for all information devices, wiring, and controls for the building. If it is a voice, video, or data signal, it either comes from there or at some point returns there.

The head-end room is almost always placed in the center of the building for physical, information, and personnel reasons. Since the media center itself is also usually centrally located in the building (for everyone to have easy access to print and electronic information), it becomes a natural extension of information access and dissemination to design the head-end room within the media center. Central placement also facilitates a star configuration cabling pattern, which improves systems flexibility.

Just placing the head-end room in the general vicinity of the media center is not enough; it needs to be in the media center. To make functional sense of the placement, look at the types of technology devices that will be in the room; the amount of visual and physical access the head-end equipment will require; the number of staff members and/or students that will interact with those items; and other rooms or areas that need to be close to the equipment.

First, consider the devices typically found in a head-end room. If the school district has purchased a video distribution system, there is likely to be a rack system filled with video devices – VCRs, videodisc players, satellite tuners, computer terminals, cable tuners, and so on – that allow for shared access. Most of these systems have a common control and monitor console.

If a phone system is in the room, its control console system also is found there. Since both video distribution and phone systems require cabling from classrooms and offices to terminate at control devices, it makes sense to bring all the facility's cabling back to the head-end room. This includes data cabling.

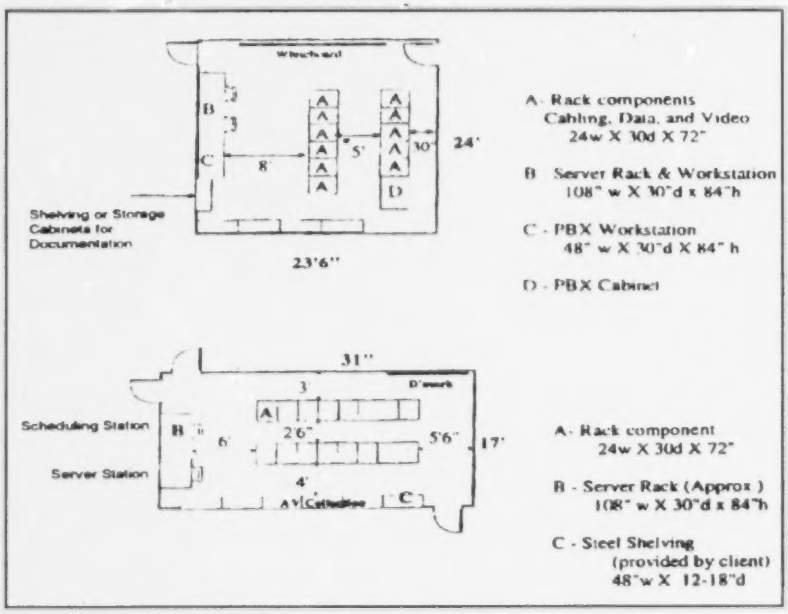


Diagram 6-2
Two Head-end Room Configurations

Second, the head-end room's precise placement is critical to the ease of interaction and supervision. While most systems in the head-end

room don't require the media staff to be in the room for long periods, convenient physical access and quick visual access to the room are extremely important. Most designs thus place the head-end room close to both the media center's circulation desk (or its equivalent) and the media specialist's office. Usually a window enables supervisors to give the room quick looks without opening a door. As school districts usually prefer that only trained staff members have access to a head-end room, most designs also secure the room by allowing access only through a secondary area, such as through a work room or media specialist's office.

It is important to place certain other electronic interactions (and the staff supervision they require) near the head-end room. The television studio or video production area, shared computer lab, large group lecture or presentation room, and distance-learning room or lab are a few of the areas that need to be close to the room. See Diagram 6-1 for a media center design one school system used that incorporates many of these areas.

Often overlooked when planning your head-end room are the environment and services necessary to keep this room functioning and provide capabilities for future technological expansions. The electrical engineer should plan for adequate power to run the initial equipment and provide spare circuits for future equipment. This should be clean power: circuits without other rooms or equipment on them. Many newer buildings have computer power on separate panel boards and isolated from other systems. Power needs for each piece of equipment should be provided to your engineer early in the design process of the building. To prevent inadvertent "shut down," it's wise to place any panel boards associated with the head-end room and video production studio in the head-end room.

As every piece of equipment in the head-end room generates significant heat and requires special treatment, extra cooling and humidifying are necessary to keep the equipment from tripping off. The BTU heat load for each piece of equipment is easily attained and should be shared with your mechanical engineer early in the design process. Don't forget that the phone system, computer hubs, servers and mainframes, and people add heat to the room.

New buildings often have night set-back thermostats and economizer systems to reduce energy consumption during night and weekend off-peak hours. *Do not* permit such a system in the head-end room, as the equipment there operates round-the-clock. The head-end room should have a stand-alone mechanical cooling system for 24-hour service with its own controls. If you are planning for a satellite dish or antenna, they should be directly above the head-end room with their cable runs terminating there. Remind your architect of the extra dead load of the dish and the need for a weather-tight sleeve into the room.

Don't forget storage areas, perhaps in a room off the head-end room or provided in metal storage cabinets.

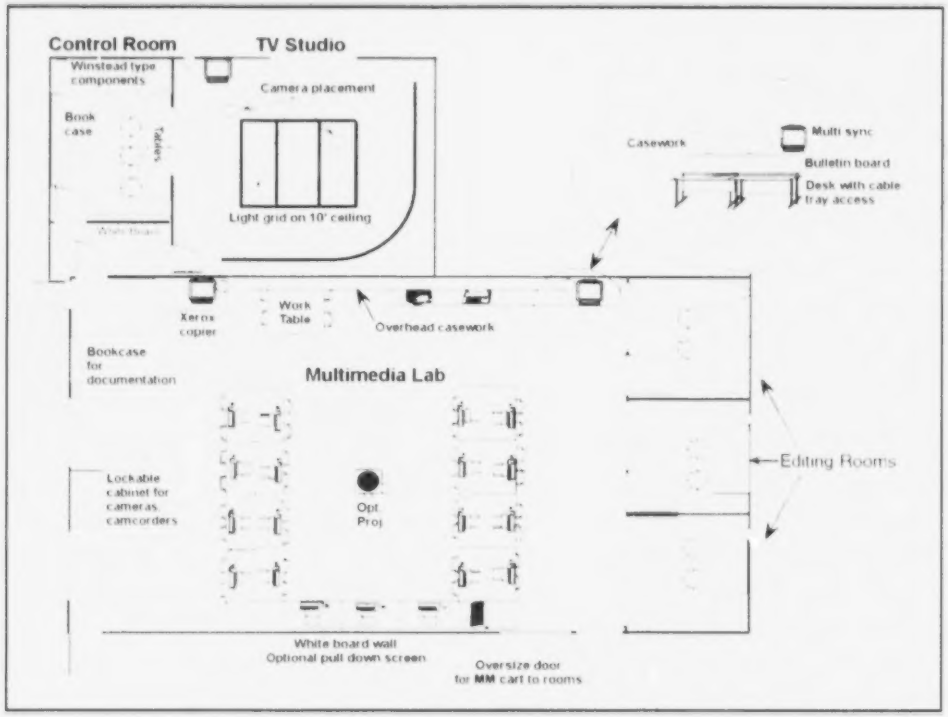


Diagram 6-3

You'll need to store videotapes, discs, phone books, loose equipment, and spare parts. A work surface for repairs will be appreciated by your technicians.

Television Production Studios

A television studio is a terrific place to introduce students to methods of visual composition and information presentation. It can help you keep your building, district, or community informed about school activities. It is even a great place to store production gear between sessions.

Whether students are in a production class creating visual projects or providing morning announcements, a variety of elements – connections, lighting, sound control, and human interactions – need to be considered.

Unlike traditional Hollywood studio settings, the typical high school television studio does not have to be a 15,000-square-foot space with a sky-high ceiling rigged with every known electrical or lighting device. Nor does it need complicated sets and props, mazes of wires, or multiple camera installations. It can be as simple as a corner of an existing media center storeroom or main library area, although larger areas offer greater flexibility in set and shot selection.

General Features

Most high school settings get along quite well with a warehouse-type studio of

20 feet by 24 feet, or a 15-foot by 20-foot "live" area with an adjoining 10-foot by 10-foot control room or editing space as shown in Diagram 6-3.

Be sure to simultaneously consider the focus range of the equipment that will be used. Generally, the less expensive the camera or lens, the longer the focus range. For instance, a VHS camcorder with a standard lens requires more focus length than an 8-mm camera does.

The studio ceiling should be at least 8 feet high, with 10 feet or more preferred. A 10-foot ceiling provides room for lighting grids and additional storage space for light-weight sets and props.

Flooring

The flooring preferred by most video studios is plain old concrete. If permanent staining is a worry, talk with your architect or consultant about sealing the concrete. Tile is an option, too, but remember that it is not uncommon for students to paint a last-minute backdrop or create a set on the floor. It is not the tidiest process.

If carpeting is used in some part of the studio, choose a style with a low nap and a tight weave that will make it easier to roll camera dollies. Another reason for a low nap: small camera parts have been known to get lost forever in deep carpeting. If carpet is a pre-existing condition in the studio space, consider installing a plywood overlay in the camera area.

Kelvin Color Temperature Scale

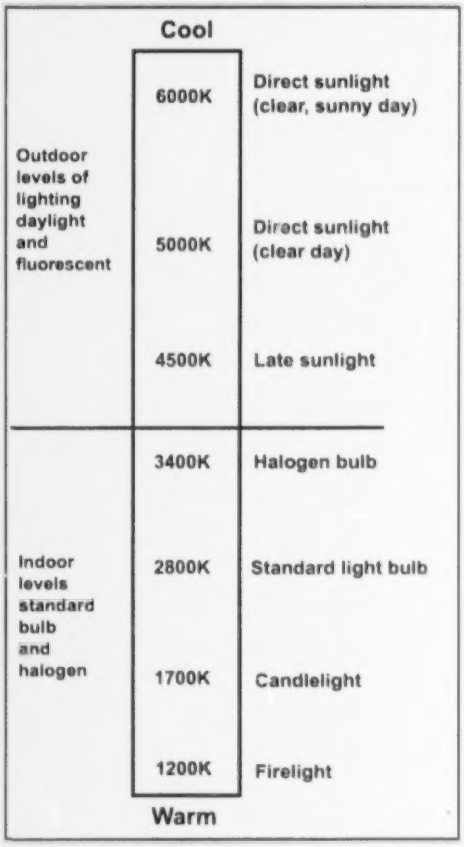


Diagram 6-4

Power and Lighting

A separate circuit for a television studio is mandatory. The project design team must be very clear with the electrical engineer that this is a non-negotiable item.

In planning, think carefully about what will be the usual locations of cameras and lights and provide enough power at those locations. A few basic tips:

- For a typical 20-foot by 24-foot studio, the preference is 100 amp AC

service with 12 to14 circuit breakers feeding 40 to 50 room receptacles, 15 of which are in the ceiling light grid.

- Don't use extension cords except in temporary emergency situations, and then use only the heavy-duty outdoor type.
- Never use "cheater" adapters that eliminate the ground and are quite dangerous.

The warmth or coolness of light corresponds to its color temperature, as shown in Diagram 6-4, with lower numbers distinguishing warmer light. So-called "white light" comes in many different tints, from the warmest orange/red of a candle glow to the coolest blue of a sky at sunset.

Professional studio lights can be purchased from local audiovisual dealers as either mounted or stand-alone sets. Other, more economical options are available. One media specialist purchased basic quartz halogen work lamps, 300 and 500 watts, in a hardware store. After drilling and mounting eight lights to light clamps (also from the hardware store), he attached them to a light grid. Each light cost about $20.

Since the studio also will be used as a "teaching" location, fluorescent lighting is needed for general use. Your architect or consultant probably will suggest color-balanced fluorescent tubes in the 3,000K range to mix with your incandescent lighting. For more control, put the fluorescent fixtures on separate dimmers.

A cost-effective light grid can be constructed using half-inch electrical conduit pipe in 10-foot lengths. The grid is set up in 20-foot sections, mounted permanently to one wall with a mounting plate, and suspended with hooks at 4-foot to 5-foot intervals. This installation allows students and supervisor to unhook one end, then carefully lower the grid to change bulbs or the placement of lamps.

A large monitor in the television studio can check for accuracy of color control and can serve as a teleprompter. A great use for old Apple IIe or GS systems is to generate scrolled text for this teleprompter. Both are analog and conveniently connected to the monitor's video with an RCA to RCA video cable. Just be sure to increase the font size for each foot of distance between the monitor and the talent. If the site has a video distribution system, don't let this monitor get overlooked. Using it as a split-screen device for distance learning, satellite, or bi-directional wide area network transmission can enable the studio to also serve as a distance-learning room.

Sound Control, Microphones, and Cables

A television studio's design and equipment work hand-in-hand to enable high quality productions.

Sound Control

The larger and more sparsely furnished the room, the more hollowness and reverberation there is. Not good in a

television studio! Talk to your architect or consultant about sound baffles to deaden bouncing sound.

Baffle panels are simply large, flat, sound-absorbing sheets or other items. Adding curtains to a corner of a studio dramatically decreases the need for other baffling. A less expensive option is to drape Army surplus blankets in strategic locations or to mount them or sections of foam onto plywood panels. Light-weight foam-core panels that can be easily moved and adapted work well when flexible arrangements are required. Place them as close as possible to a speaker's face without letting them get into the shot.

Microphones

With microphones, distance is everything.

- A $50 dollar mike that is one foot from a sound source sounds better than a $500 mike that is 25 feet away.
- A VHS camcorder's built-in mike needs to be within 10 feet of a sound source. After it moves a bit more than 12 feet from the source, it begins to pick up room echo and audience noise.

The rule of thumb: Always get a mike as close to each sound source as possible. Either place a lavaliere mike (a small mike that hangs around the user's neck or clips onto clothing) on someone who is a sound source (especially if he or she is on the move) or use a high-quality directional mike within 10 to 12 inches of a speaker's mouth. Most studios prefer a mix of cardoid (also called directional) and omnidirectional microphones.

Watch for impedance ratings on microphones, too. High-impedance mikes usually cost the least, but the longer the cable run, the duller they sound. Low-impedance mikes usually cost more, but they can push a signal through hundreds of feet of cable. Although this is not always true, the connector on a mike is usually a signal of its impedance value. A three-pronged, XLR or Canon balanced connector is usually on a low-impedance mike, while a 1/4-inch type usually is on a high-impedance mike.

The size and space design of a studio helps define the kind and cost of microphones to be used there. If, for example, the room is 24 feet deep and the intent is to place an omnidirectional mike to pick up ambient sound, a fairly good low-impedance mike is called for.

Adding a mixer allows multiple mikes to be combined into one signal. Most mixers allow the tonal balance of each mike to be altered individually or as a mix of the whole. Some mixers have signal meters that tell the health of the signal at a glance. Most mixer outputs operate at what is called a line level. This is a full-strength signal, already amplified by the board's electronics. Even the highest quality audio mixer costs only a few hundred dollars, and it is a technology purchase that pays for itself on a daily basis. Most are portable enough to go from television studio to media production lab to gymnasium or

wherever else one is needed. Consider purchasing more than one.

Cables

Another often overlooked technology component of a typical studio setting is cables and how they are treated and placed. A cable has four distinct parts: a signal carrying conductor, a shield, the insulation, and an outer jacket. The most important factor to a cable is its shield, which intercepts and carries away stray electromagnetic noise before it has a chance to infect your signal. If it weren't for this shield, every electronic signal in the air would have a chance to piggyback on your cable. Once you know that a cable without a shield is called an antenna, you get the picture.

Generally, you should use the shortest possible cable. Longer cables subject a signal to more interference. Always keep signal cables as far as possible from electrical cords. Where they must intersect, make the junction at right angles to minimize interaction. Signal cables running side-by-side will share signals to some degree, so keep them apart if possible.

Don't overlook the need to store and secure all of the studio's mikes, mixers, and cables in a large, *locked* cabinet. Place the cabinet right by one of the entrances to the studio; this ensures that an unexpectedly needed piece of equipment can be retrieved without interrupting a shot or scene.

Curtains and Sets

A studio also needs space where sets, furniture, and unused equipment can be stored. One inexpensive and convenient solution is to place the main set's curtain grid 20 to 24 inches from the wall. The area behind the curtains makes a great space for storing flat sets and even unused furniture.

When considering a color for the set curtain, don't overlook the obvious: neither white or black is a good choice. White reflects too much light; black absorbs too much light. Most professional studios use either a blue or gray curtain. This "neutral" look allows quick and easy chromatic control for graphic special effects.

Professional curtain grids and controls are ideal, but less expensive options are available. Army surplus blankets double as sound baffles and provide an easy color to chromakey. Installation can be managed with heavy-duty safety pins or shower curtain hooks for slide control.

Curtains and sets and even equipment can sometimes be obtained from local professional television studios and photography studios that are willing to donate used materials.

Control Rooms

Audio and video signals are sent from the studio to a control room where signals are adjusted. In a school setting, the preferred spot for a television studio's control room is between the

studio and the multimedia production lab, adjacent to the head-end room. This design allows for bi-directional transfer of signal from desktop, to control room, to studio. It also allows for the best use of school personnel supervising student activity.

Don't place the control area's window facing the set. Most professional production studios place control boards, special effects generators, and camera monitors on a stacked wall facing away from the set so that the control staff learns to judge the quality of the signal and action through the eyes of the camera and the ears of the sound-control devices.

Remember that a school setting is not a pure production situation, and a teacher, supervisor, or media staff member needs to be able to monitor student activities in the control room. Plan window placement accordingly.

Multimedia Production Areas

Audio, video, graphics, and text can be manipulated into presentations – from reports to Web pages to television programs using multimedia production equipment. When it comes to identifying the equipment, spaces, furniture, and networking needed for multimedia production areas in a school facility, learning the difference between linear production technology and nonlinear production technology is a good place to start.

Linear Production

Basically, linear production means "video." To record, the camera or camcorder's tape heads actually store a "magnetic" picture of the fluctuating signal (changing voltage) onto the surface of a videotape. Editing or control systems have to reproduce this picture exactly, without much error or unwanted noise, in order for a second good image to result. Longevity and low cost are linear editing's greatest assets.

On the other hand, linear editing equipment is not necessarily flexible or fast. It can be hard to build a program out of chunks of videotape using a linear editing system. For example, each time students transfer from one videotape to another, they lose a generation of quality. The only way for them to change a previously made edit is to perform a new edit on top of the old one. If the scene they want to add or change runs a little longer than the old one, they end up covering up a bit of the original desired footage. If the added scene is too short, they have a bit of the old shot left in the program. Each time a copy of this original signal is transferred to another tape, the signal weakens or dissipates.

Nonlinear Production

Nonlinear production is a computer-based system. Instead of using a fluctuating voltage signal, digital video information is stored as a series of binary digits (0's and 1's). Since it is much easier, electronically, to reproduce these

simple bits (just two possible values) than an intricate magnetic picture (as video does), digital systems usually offer a higher quality image with little or no generation loss. Nonlinear systems allow students to work on any part of a production at any time, and changes are more rapid.

Of course, none of this happens without first getting the video into the computer with a video digitizer. A digitizer card or device is placed inside the computer to convert motion video into data files that can be stored on the computer's hard disk. A stream of digital video is huge, requiring many megabytes of storage for each uncompressed video second. Even the multiple gigabyte drives found in many multimedia computers only hold a few minutes of raw video footage.

To make digital video manageable, most digitizers use a codec to compress the data before it is stored. ("Codec" is derived from COmpress-DECompress.) What happens to the image when it is compressed and decompressed? That depends on the codec. Usually, the lower the compression ratio, the cleaner the decompressed video will look.

With nonlinear editing systems, students are no longer slaves to VCR decks. Once footage is digitized, the computer becomes a sort of virtual editing system. It is easy to jump around in a production at a click of a mouse and get an instant look at cuts. There is no need to remember time codes or counter numbers, and each cut can be reversed or changed.

Yet even with all the flexibility offered by nonlinear editing, linear editing still has appeal. Both systems deserve places in school studios because:

- Many input devices are the same for both video and computer editing systems, including camcorders, videodisc players, still video, Elmo-type presenters, audio mixers, cassette tape players, and CD-ROMs.

- Students and staff members who want to work on a project where speed is more important than quality are likely to gravitate toward the video production systems. Students creating Web site information or more professional-quality productions probably will prefer to use a computer digital setting.

- The cost of a video production is more in time than in equipment. A digital production usually requires less time but more costly computer hard-drive space.

- The time to train and supervise both processes is about the same. Both processes are extremely involved and require much initial assistance.

- In most cases, it is not only possible but typical for a group of two to four students to work collaboratively to make a linear creation. Because only one person manipulates the image on the computer, nonlinear creations usually involve no more than two students.

As production technology evolves, eventually the most complex digital systems are likely to become simpler and more cost effective. This means it is wise to plan for spaces and systems that can transition from linear to non-linear production. Designing spaces that place linear areas – the television studio and linear editing rooms – adjacent to multimedia production systems allows for this transition. It also enables video input devices to collect signals in a studio and then be easily wheeled or carried to the multimedia area. A high-end digital camera could be used for studio needs in the morning and then for pre-mastering a recordable CD in the multimedia lab that afternoon.

When planning spaces, be sure to accommodate staff members who will provide assistance. Students using high-end and complex technologies need a collection of staff people assisting at the right places and right times. Space designs should enable staff members to take as few steps as possible during the course of a day and to have as much visual access between rooms as possible.

The media center plan shown in Diagram 6-1 includes many of these staff-thoughtful elements. The spaces are designed to provide optimal visual supervision, easy access when providing assistance, and sensible traffic patterns.

Information Commons/ Electronic Cafe

The right facility design can make expanded media centers manageable despite unexpanded media staffs. Two relatively new space ideas address the challenge: the information commons and the electronic cafe.

Information Commons

The information commons provides for a large information structure strategically placed in or near the middle of the media center. Basically, it is an updated circulation desk. Whether circular, rectangular, or square, it must be positioned in a high-traffic location. The basic premise is to allow the staff to assist several students with a variety of informational tasks without having to move far to access the appropriate resources.

Items and services usually found at or near the information commons are:

- Internet access stations

- Printing and supervised printout pickup
- Video lesson makeup for students who missed classes
- Information on cable channel access
- Online activities
- Assistance in creating home pages
- Access to student e-mail accounts

The other design innovation – the electronic cafe – takes centralized information access to a versatile, modular level. Instead of furnishing the entire media center in one standard design, distinct modules create "stations" or "activity areas:" stand-up counters for quick get-it-and-get-out access; small sit-down stations for individual research activity; and larger, multiple groupings for media production or prolonged group access. Electronic cafes usually don't require custom design. But be sure to use flexible, easy-to-relocate furniture to enable future growth and change.

Distance-Learning Spaces and Places

Undoubtedly, the most expensive space to incorporate into a school technology design is a distance-learning area or lab. Although it sounds easy to just take an old classroom and add a few computers, some wiring, a codec, a couple of cameras, and a projection device, this probably is not the best long-term or most cost-effective solution.

School districts understandably get nervous about justifying the $200,000 to $350,000 investment needed to create a high-end, bi-directional, distributed voice/video/data distance-learning lab, especially if they are questioned about the flexibility and longevity of this

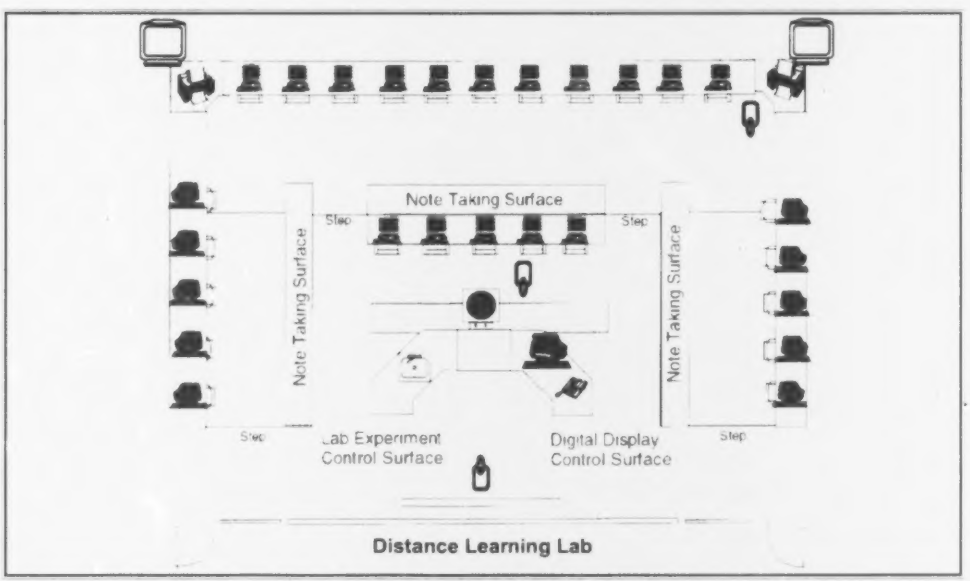


Diagram 6-5

expenditure. But what if this learning lab could be used for a variety of student and staff activities that need high-tech spaces and systems? What if including and installing equipment and systems could be phased in as the learning program and resulting needs evolve? What if the space, infrastructure, and systems design were flexible enough to adapt to unknown future needs? Then does it make sense?

If so, consider the 26-station tiered lab design in Diagram 6-5.

- The instructor has clear visual access to every student computer screen from the front of the room. He or she can use the large-screen projector (in the ceiling) to introduce, reinforce, or share individual screens.
- Students pivot to a note-taking and viewing position by facing front for the instruction and demonstration (which also means there is no messing around with keyboards or desktops at inappropriate times). This pivoting option also allows the room to be used for multimedia presentations, staff meetings, general lecture, and evening use without needing to activate the computer network.
- After the instructor's demonstration, students pivot back and face their computer screens. Optional corner monitors allow them to "keep pace" by glancing up without turning around. These monitors can be split easily for viewing several local or remote desktops.
- All foot traffic (coming in, going out, printing) is diverted from the front instructional area to the sides of the lab.
- Three cameras allow for room-wide shots of the instructor, individual focus on any student in the room, and the instructor's work space.
- Ceiling microphones and sound baffle panels are in place for special acoustical situations.
- The instructor's control station can be stationary (if, say, water or gas hook-ups are needed) or portable in sections, as desired. All controls for lighting, sound, and so on are carefully designed to provide "user friendly" control. For instance, a special lapel pin can send a control to the camera so that the camera automatically follows and focuses on the instructor.
- There is full compliance with the Americans with Disabilities Act for both instructor and students.
- A combination of fluorescent and incandescent lighting provides proper lighting for a variety of tasks and situations.

With pre-planning for space and infrastructure, this lab can be installed easily and budgeted in phases. Phase 1 might be as a general lecture room and/or computer lab; Phase 2 might add the

projection and corner display devices; and Phase 3 might complete the evolution with the addition of microphones, cameras, and other finishing touches.

Lighting for Computer and Distance Learning Labs

Classrooms that include computers or projection devices require enough light for general use as well as controlled light for special tasks. Because the human eye is drawn to bright images and because a too-bright room creates reflections, light sources and room surfaces need to have the same brightness ratio. To eliminate, or at least lessen, glare on computer screens, lighting levels must be seriously considered.

Lighting must be accommodating to multiple computer and teaching tasks and situations. Flexibility can be attained with the combined use of wall-washer light fixtures, cove lighting, recessed downlighting, and general fluorescent lighting. Parabolic reflectors work well with fluorescents and PAR lamps offer focused baffle downlight. Certain pendent (suspended) fixtures offer both direct and indirect lighting. Be aware that improper placement – too close or too far from the ceiling, or too close together – can result in hot-spot images on computer screens. Indirect lighting on wall surfaces can dramatically reduce the amount of reflected light. The user should also have controls to dim and switch separately each lighting system from several locations in the room. Lighting flexibility and controls will provide the user with a wide range of options to customize lighting for each operation.

Distance learning labs and classrooms where activities are to be taped or broadcast have multiple display devices, computer monitors, teaching areas, and video transmission equipment that require special attention. The answer, again, is two lighting systems.

The general lighting can be parabolic luminaires that include special reflector optics. Additional "spots" or indirect lighting systems are needed over the instructor's station, on the two side wall areas and, especially carefully placed, over note-taking tables. These should be shielded to limit spill light and should be focused in relation to camera and monitor locations. Dimming controls are necessary and, depending on a room's size, there should be up to three separate lighting control banks that give users total control over light/darkness.

Walls and Casework

By designing above-station casework on side walls, there will be plenty of room for storing supplies and documentation. Place bulletin material between the casework and computer furniture surface so that easy how-to diagrams can be mounted. If necessary, reserve the rear wall for additional sound baffling.

Media Centers in Middle Schools and Elementary Schools

Media centers at the middle school and elementary school levels are, of course, very similar to those in high schools. But while a middle school media center needs to incorporate many of the same functions and spaces found at the high school level, middle school environments support a different philosophy that focuses on exploration and discovery in a controlled setting.

A technology lab for distance learning/creative digital work/multimedia/general use — such as in Diagram 6-6 — is desirable at the middle school level, with 10 to 20 stations rather than 26, espe-

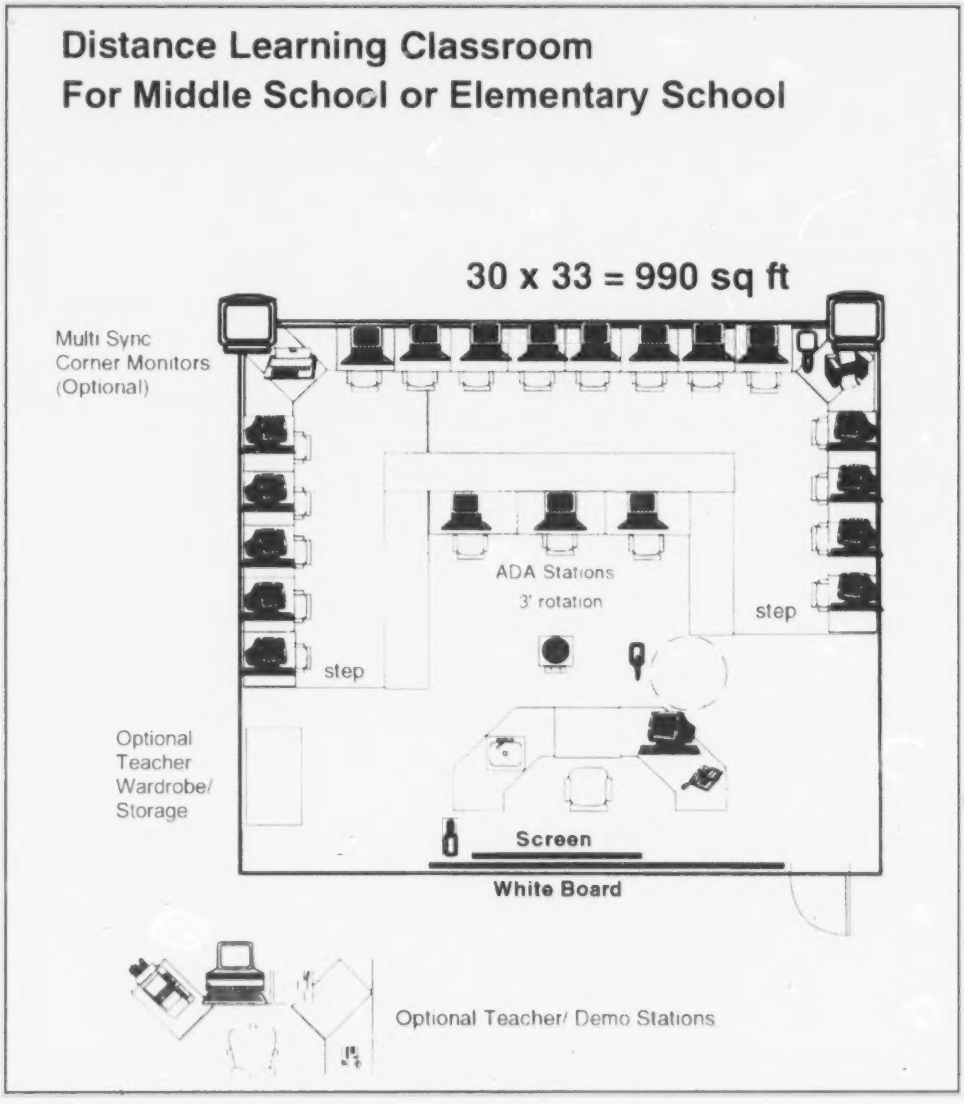


Diagram 6-6

cially if the learning program does not require an entire class to be in the area at any given time.

In an elementary school, the media center serves the school district's youngest – although not necessarily its least technologically savvy – students. Technology use has led to design changes, including in the once familiar, carpeted storytelling/reading pits. Now raised seating areas are replacing the pits, especially where the area has built-in video distribution capabilities, to accommodate carts carrying VCRs and monitors.

Elementary school media centers are also getting a new look and scope with the addition of easy voice access (telephone connections), video access (either as a wiring connection or a carefully planned VCR space), and data access (don't forget those stories that can be read and shared via the Internet). Students are taking on tasks such as retrieving e-mail, updating their home pages on the Web, word processing documents, and creating multimedia presentations.

Whatever the age group, a school media center needs to provide technology in many forms for many functions. A technology-rich learning environment no longer is an option; it is a must. By learning what is needed, working closely with your architectural team, and planning carefully, it is possible to have effective, well-equipped media centers that are capable of expanding and changing with the technology of the future. Now, that is money well spent.

Chapter 5: Technology Systems Planning

This chapter looks at a standards-based approach to a school district's infrastructure and how it relates to voice, video, data, and other communications systems.

In the early days of planning for technology, any mention of a "network" in technology plans usually referred to a computer lab unconnected to the rest of a school building, the school district, and the outside world. Today, the building-wide networks for data, multimedia video retrieval and distribution systems, and telephone systems are common elements in many school technology plans.

If you are planning a new building or renovating an existing facility, you must consider how to provide appropriate infrastructure for voice, video, data, audio, security, and environmental control systems, all of which are necessary to transmit information throughout buildings. Building planners and designers must understand that facilities and wiring systems have to be included in an integrated manner as core components of total building systems.

Early computer lab networks composed of a hodge-podge of different equipment posed a few problems that could be resolved by tinkering and tweaking. But as labs were connected to other parts of a building and to other sites outside the building, it became apparent that constant tinkering and tweaking could not overcome the basic problems of equipment incompatibility and the inadequacy of small networks to support a large number of devices.

Schools now design their electronic networks around established data network standards that include robust cabling infrastructure, standardized electronics, and network management software that makes operating networks more consistent and less labor intensive.

Using a standards-based approach to communications infrastructure in new and refurbished buildings is a key to successful communications networks. A

standards-based design can assist in reducing premature obsolescence of hardware and is more adaptable to change. And a well-designed system is highly scalable, providing an infrastructure that can provide effective communication for many years.

Cabling infrastructure is the current Achilles heel of school networks. Virtually everyone understands the value and necessity of providing access to the Internet, multimedia, and audio and video conferencing capabilities. But the "nuts and bolts" of providing an infrastructure that meets the unique requirements of the education environment is often overlooked or its importance is misunderstood. A well-designed, robust infrastructure is as important to communications networks as a strong foundation is to a new school building. Careful planning before the first cable is pulled goes a long way toward creating a network infrastructure that will last for many years to come.

Infrastructure

The communications infrastructure of a building is far more than simply wires and cables that carry information from one place to another. Just as the HVAC (heating, ventilating, and air conditioning) infrastructure carries hot or cool air and the plumbing infrastructure carries water, the communications infrastructure is a system of components created to provide a communications "pipeline" that can be managed and understood by anyone who has learned some basic principles.

Consider some differences between communications systems and the infrastructures of HVAC and plumbing. The latter two have been mature technologies for many years, with few major revolutions in ductwork or water pipes. Many firms manufacture ducts and pipes and many people can install the hardware. HVAC and plumbing are both based on standards; what works well in one building can be adapted to work in another. If the installer runs out of Brand X copper pipe, Brand Y can be installed in its place.

Communications has developed differently. Frequent innovations and advances in electronics force a constant redefinition of what is considered state of the art.

In the days when shared mainframes ruled the data world, there were few communications choices: IBM, Amdahl, or DEC. Each system had its advantages and disadvantages, but the biggest disadvantage was that all were proprietary systems. Purchasing a particular system generally required also purchasing the same manufacturer's hardware, software, upgrades, and maintenance. These old systems were not "open," meaning that their buyers could not mix and match components from different vendors to create a system that fit the unique needs of an individual school district.

Then came the development of the microcomputer (personal computer) and the waning of the mainframe as a primary computing tool. Personal computer networks quickly caught on in the mid-1980s. Some computer networks, however, developed the same closed, proprietary systems that had helped kill off the mainframes. The old mainframe way of thinking lived on.

Now, fortunately, new ways of thinking about computer networks are beginning to give school districts more assurance in their purchasing decisions. This is the primary benefit of standards in system design.

Structured Cabling Systems

Selecting appropriate bandwidth is an important step in systems design. Bandwidth is the capacity of a network to carry data. Table 7-1 shows data transfer rates of common document types at various common transmission speeds. As more graphics-intensive applications are introduced to computer networks, more network speed is required to keep up with user demands.

As computers continue to become faster and more powerful, they need more network bandwidth to "communicate." Network hardware can be upgraded to eliminate bandwidth bottlenecks in specific locations. But limitations in communications cabling infrastructure can make it impossible to increase network capacity and speed.

The lesson for those planning a computer network is to never underestimate the capability of the network to use up the bandwidth provided. Schools need to plan network infrastructures with capacity to grow in size and handle bandwidth requirements of computers and computer networks of the next decade. The network infrastructure must be designed so that it will provide a simple "plug-and-play" solution to network speeds and capabilities that are constantly increasing. A structured cabling system is the scalable method that enables schools to build, organize,

Time Required for Data Transmission					
Function	Size of	Data Transfer Rates (in seconds)			
	In Bytes	9.6 Kbps	1 Mbps	16 Mbps	100
Email message	1.6 KB	1.4	0.01	0.0008	0.0001
1 Page Text	3.5 KB	3	0.03	0.002	0.0004
Graphics Drawing	48.8 KB	42	0.4	0.2	0.004
VGA Color Screen	3.0 MB	2621	25	1.6	0.25
8.5x11 Scanned Color Page	24.1 MB	21059	202	12.6	2

Table 7-1

and grow a communications infrastructure to meet that challenge.

Using a standards-based fiber optic cabling system is the best way to create a network infrastructure that has a chance to be effective and functional 10 to 20 years from now. But such a system is highly expensive in light of schools' generally scarce resources. Economizing can mean making a purchase that will be out of date in two years and not providing an important, valuable, and perhaps necessary tool to schools and students.

Cabling standards help to protect buyers and enable them to upgrade over time. The primary standard for communications cabling infrastructure (as of 1998) is the ANSI/TIA/EIA 568-A Commercial Building Telecommunications Cabling Standard. This standard enables facilities and cabling systems to be designed as fully integrated systems. The standards use a "systems approach" to cabling, also referred to as "structured cabling."

Benefits of a structured cabling infrastructure include:

- Specification of distances and electrical capabilities (important for computer networks) that will be able to accommodate higher network speeds as well as those of today.
- Flexible, modular design that makes moves, additions, and changes much more straightforward and easy to document, saving time and money.
- Simplification of cabling design so that any network problems affect fewer users and are easier to isolate.

The "structured" aspect of a structured cabling standard refers to the subsystems that make up the standard:

- Entrance facility
- Head-end/equipment room
- Telecommunications closets
- Backbone cabling
- Horizontal cabling
- Work areas

Each subsystem interconnects with the other subsystems to build the entire structured cabling infrastructure and is described below..

Entrance Facility

The entrance facility, also known as the demarc or demarcation point, is the transition area of a building where cabling from the outside world terminates and links to the building's own cabling. The outside cabling might be a few telephone lines from the local telephone company, many strands of fiber-optic cable from another bandwidth/service provider such as a cable company, or school district cabling that connects school district buildings.

Entrance facilities have some special requirements that other subsystems do not. For instance, since the demarc is usually the transition from the regulated telephone industry or cable industry to

the non-regulated building infrastructure, local codes and policies may affect the location of a building entrance facility. These need to be checked with the appropriate companies that will be using this area of the building. In situations where an entrance facility is a "node" on a larger community network, special requirements for locked, secured rooms may be necessary.

Other technical features are specific to building entrance facilities. The need to protect the electronics inside a building from possible electrical voltage overloads requires that fuses on copper cables enter the building. If fiber-optic cable is used, voltage is not an issue, but a transition from "outdoor" fiber to "indoor" fiber must be made. This could be as simple as a cable splice tray, or it might involve more complex hardware to convert the incoming signal for use inside the building.

Head-end / Equipment Room

The next area of a structured cabling system is the head-end room, also known as the equipment room or network center. This room is a dedicated, locked area where electronic equipment is mounted and connected to provide voice, video, and data connection to all the cabled locations. In small, single-building situations, the head-end room might be in the same room as the entrance facility. In a large, multiple-building environment, it might be one of several

Technology-Related Acronyms

CAN — classroom-area network

CD-ROM — compact disc-read-only memory

IS — information services

ISDN — integrated services digital network (digital communications that transmit voice, video, and data over standard phone lines)

KSU — key service unit (a type of phone system)

LAN — local-area network

LIU — lightguide interconnect unit

LST — lightguide splice tray

MIS — manager of information services

PBX — private branch exchange (a type of phone system)

UPS — uninterruptible power supply

UTP — unshielded twisted pair (a type of copper phone cable)

WAN — wide-area network

dedicated rooms for communications transmission hardware.

Typically, the head-end room serves as the termination point for all the cabling in a system. Connections to the entrance facility are terminated in this room on modular panels that allow simplified moves, additions, and changes. Cable runs to classrooms and offices from the head-end room.

Equipment housed in the room varies, depending on technology applications selected at the school. At a minimum, the room contains a computer hub and telephone system. It also might contain computer servers, a minicomputer or mainframe computer, and a video system.

The ability to control the room's environment is the most important element in designing a head-end room. Environmental control includes:

- **HVAC system** The heating, ventilation, and air conditioning system must be designed to maintain the temperature and humidity requirements of the hardware inside the head-end room. This generally requires a dedicated, commercial-grade air conditioning unit to maintain optimum temperature and air circulation around sensitive electronics. Specific hardware requirements vary from vendor to vendor.
- **Electrical system** Both the capacity and quality of electricity for network hardware need to be taken into account when designing a head-end room. Erratic electrical power is a major cause of voice/video/data network system failure. Electricity can harm network electronics in two major ways: by quickly destroying it with a large surge, or by slowly destroying it with power fluctuations.

Computers and equipment are very prone to damage from voltage surges – increases in voltage caused by changing electrical needs in a building or from the electrical service to the building. To eliminate this potential damage to computers and network equipment, it is desirable to place all computers on circuits that are separate from those feeding lighting, standard utility plugs, HVAC equipment, and similar needs. The circuits designed to do this are fed from separate breaker panels and from special transformers that provide filtering and surge protection as well as an increased neutral circuit capacity.

- **Security system** Because of the large investment in sensitive network electronics and the highly specialized nature of working on voice, video, and data networks, the head-end room should have restricted access. If it is in an uncontrolled room, individual locking cabinets for all the hardware and terminations can keep unauthorized people away from the equipment. If the head-end room is not in a dedicated space, set it up so that its entrance and the room itself can be easily monitored.

A head-end room must not be an afterthought in building design. Its size and

design are crucial. It is the heart and brains of a modern communications network. Its computer servers run mission-critical applications.

All its complex hardware needs to be accessible to and carefully maintained by qualified technicians. In addition, the room's design must accommodate a wide variety of possible future equipment and allow technicians to move around comfortably as they control it.

Telecommunications Closet

A telecommunications closet is used in areas where long distances or multiple floors require an intermediate cross-connection area for cables. The closet might contain active electronics, such as a local network hub, or it might simply be the cross-connection between the horizontal cabling system serving its floor to the backbone cabling from the head-end room.

A telecommunications closet has many of the same requirements as a head-end room. It should be a securable area and have access to appropriate power if it is to contain active electronic equipment. It can, of course, be smaller than a head-end room.

Backbone Cabling

Backbone cabling, also referred to as riser cables when used within a building, may or may not be used in a structured cabling design. It can run between buildings in a campus or wide area environment and between floors within a building. This subsystem serves as the main conduit for a computer network. All other subsystems and networks are connected to it.

Horizontal Cabling

The horizontal cabling subsystem of a structured cabling infrastructure connects a floor's work areas to the head-end room or to a telecommunications closet. In a modern infrastructure, the cabling from the head-end room or telecommunications closet is in a "star network topology" or "homerun topology," in which a single run of cable has only two terminations. Bus topology, on the other hand, makes the rounds from stop to stop.

Star Topology

Bus Topology

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In a star or homerun topology, connections could include:

- cable from the data switch in the head-end room to a termination for a workgroup hub in a telecommunications closet;
- cable from a workgroup hub in a telecommunications closet to a wall outlet in a classroom; or
- a single run of copper cable to a wall outlet for an office telephone and/or computer.

Each horizontal cable in a star or homerun toppology is a dedicated run for a single device. The horizontal cable might connect to the hub of a local area network (LAN) that serves multiple computers, but the cable to the hub is not shared. This dedicated cabling helps to make structured cabling a robust, scalable network infrastructure.

Work Areas

The work-area subsystem is the final link in a structured cabling system. It provides the connection from the horizontal subsystem to the voice, video and data hardware in a classroom or office. This area consists of the patch cables and terminations that allow various devices to operate properly.

The work area should be simple to modify to accommodate different applications. For example, an outlet should be easily accessible so that it will be simple to change it from a termination for a UTP copper cable for an analog phone line to an ISDN (integrated services digital network) line that can carry much more information.

A Structured Cabling System Scenario

Here is a scenario of how a well thought-out structured cabling system might function.

A three-story school built in 1967 has been fitted with a state-of-the art structured cabling system to provide a foundation for new voice, video, and data hardware. The building's entrance facility is in the basement's locked boiler room. Two 4-inch PVC (polyvinyl chloride) conduit pipes from a galvanized steel box on the outside wall of the building allow cables to enter from the telephone pole outside.

One pipe is used by the telephone company for a 100-pair copper cable's entrance to the building. The pipe is filled with a foamed firestop material on the inside and has a weatherhead on the outside.

The cable enters the building and is terminated on one side of a lockable, wall-mounted block protector panel. The building is in an area prone to lightning, so the panel is equipped with solid-state protector units to provide maximum protection for the internal copper cabling. A second set of blocks is next to the protection unit. A backbone of four 25-pair plenum cables (cables which, in a fire, emit low smoke or no smoke) runs from the block to the network center on the first

floor. Between the protection block and the indoor backbone-cabling blocks is cross-connect wire establishing a connection.

In the 4-inch PVC pipe next to the telephone company cable is a six-strand, single-mode, fiber-optic cable from the local cable television company. It is terminated on a wall-mounted LIU (lightguide interconnect unit). This LIU terminates the gel-packed, outdoor-rated cable.

The basement boiler room is dirty, hot, and humid, but there are no active electronics in the room.

The school's head-end room is a 15-foot by 30-foot room next to the library. It has a single lockable door, a row of windows facing the library, and double doors leading into a hallway. For security, the double doors always stay locked. Previously, the space was the library's storage room for carts of audiovisual equipment. It was freed up by removing the equipment from the carts and integrating it into the school's video distribution system. The head-end room still houses a large library of VHS tapes, CD-ROMs, and videodiscs. The room also serves as an office, but since the librarian spends more time with students than with hardware, the room generally is unoccupied.

Starting in one corner of the head-end room, a row of cabinets stands out 3 feet from the wall. The cabinets are approximately 6.5 feet tall and have locking doors on the front and back. The quiet hum of cooling fans can be heard from each of the cabinets.

Above the cabinets are metal trays holding cables that run between the cabinets. The trays also carry conduit with newly run power for electrical connections for the equipment racks.

Several electrical circuits are dedicated to this room. Some run through an uninterruptible power supply (UPS) to help ensure a steady supply of clean power for the hub and servers there. If the power goes out, there is plenty of time to perform an orderly shut down of the equipment, making sure that no important data are lost.

Each cabinet is labeled and well organized. One is full of fiber-optic terminations grouped together in lightguide splice trays (LSTs) and labeled to show which classrooms and offices they serve.

The next cabinet is labeled "UTP terminations" and is filled with modular copper-cable terminations for telephones. The terminations are labeled according to the room numbers they serve.

Cables from these two cabinets in the head-end room lead to three 4-inch PVC conduits on the wall. This is the start of the backbone/riser and horizontal subsystems used for distribution within the building.

The rest of the cabinets are filled with humming pieces of hardware that fea-

ture flashing lights: hubs, switches, CODECs, and servers providing local area and wide area voice, video, and data connectivity. Separate rows of cabinets are filled with VCRs, videodisc players, and CD-ROM towers. Occasionally, some of the equipment stops, starts, or pauses, as teachers in classrooms throughout the building operate it via remote control.

The head-end room is the most vital aspect of the building's structured cabling infrastructure. Successfully operating voice, video, and data networks is directly related to the planning, installation, and maintenance that goes into this room.

No cables are visible from hallways. Because all the horizontal and backbone cables in this school are plenum rated, the installers were able to place cables in the plenum air-return space above the drop ceiling. A look above the ceiling tiles reveals fiber-optic cables and copper cables running in several directions for distribution within the building. The cables are neatly bundled together and attached to the supporting structure with metal D-rings. To create some slack in order to avoid stretching the cable, there is a gentle sag in the cables between the supports. As they turn corners, the cables make a wide sweep to avoid exceeding the minimum bend radius of the fiber and Category 5 cables. The cables are never kinked and never make extremely sharp bends.

Just inside the entrance to a classroom is a plastic box mounted low on the wall. This is the multimedia information outlet, and a termination point for some of the cables distributed from the head-end room. The cabling that runs between each classroom information outlet and the head-end room or a telecommunications closet is the horizontal subsystem.

In the classroom, the work area subsystem consists of the multimedia information outlet; the voice, video, data hardware; and the cables that connect the hardware to the outlet (in this case, a six-strand fiber optic cable and a Category 3 UTP copper cable).

Voice, Video, and Data Communications

In the past, communications was divided into three separate areas: voice, video, and data systems. Organizational units grew up around these areas: the telephone department, the MIS (management of information services) or data communications department, and audiovisual services. Each group had its specific expertise and usually did not interact with another unless absolutely necessary.

Today, voice, video, and data are much more closely related. The desktop PC can be used for voice and video as well as its traditional data applications. ISDN phone lines can carry compressed video. Video systems are used to display data applications and enable video conferencing. And all communications are carried over the same kind of cabling infrastructure. Voice, video, and

data signals – digital or analog – all can be transmitted on UTP copper, fiber optic, and coaxial cables.

Thus, separate cabling infrastructures are no longer needed. One well-designed cabling system can carry all the signals for almost any piece of equipment. This is the modular nature of today's communications technology.

Video Distribution System

Video systems vary widely in capability. The most basic provides "cable" type television to various rooms in a building. This can be as simple as bringing the local cable television provider's signal into the school (often free of charge), removing some channels, inserting some school programming (such as a calender of events and a student-produced news program), and distributing the signal to monitors throughout the building.

A more complex video distribution system could provide acess to video resources, such as VCRs, and videodisc players maintained in a central location. The system may allow these devices to be controlled from classrooms, including all the play, stop, and rewind functions necessary.

A still more sophisticated system can integrate those functions into classroom computers.

A video distribution system's main advantage over the old "cart-and-kid system" is that it provides an excellent method of controlling a limited number of resources. Aspects of that eased management function include:

- Physical wear and tear on hardware is reduced.
- Easy resource tracking helps school leaders budget knowledgeably and purchase items most needed.
- Scheduling software in the distribution system tracks what hardware and software are used and when they are used and provides detailed tracking of system resources.
- Time spent loading, shuttling, and unloading carts of equipment is eliminated, allowing more time and attention for actual classroom applications.
- Hardware upgrades are transparent to classroom users, who never have to learn how to use new buttons from a new manufacturer.

How a video distribution system is designed and controlled determines a great deal of its flexibility. Systems are described in terms of bandwidth (the capacity of a network to carry data). A system can be broadband or baseband.

To envision a **broadband** system, imagine a video distribution system as a six-lane highway. In normal operation, each vehicle must not exceed a certain width in order to fit into each lane. The highway keeps all the vehicles in their own lanes.

Broadband distribution is familiar to most people as the method by which

cable television signals are transmitted to homes. A single cable carries 40 or 50 television channels, and the television viewer is able to switch from one channel (a "lane" in this analogy) to another.

The advantage of a broadband system is that it allows less investment in infrastructure. Typically, a broadband system works over a bus topology. Each classroom views one channel at a time, but all channels are available to all classrooms at the same time.

The disadvantage is that the system is confined by the size and number of channels ("lanes") available. For example, the bandwidth (carrying capacity) of a typical coaxial cable-based system is 500 MHz. Each channel requires 6.5 MHz, providing less than 80 available channels at one time. This limits the number of users on a single system at one time to 80, which greatly limits the flexibility of the system.

To envision a **baseband** system, imagine that only one vehicle at a time uses the six-lane highway. The vehicle is not restrained by the width of the lane or by other traffic. It can be as wide as two, three, or all six lanes of traffic. This large, single vehicle can carry more cargo than a vehicle that is only one lane wide.

Baseband signal distribution has the entire road to itself. It can be defined as a single signal using a pathway from a source to a destination. For example, if a user wants to view a tape played on a certain VCR, that VCR's signal is the only signal on the pathway (cable). This method allows greater flexibility in the type of signal that can be delivered and in the number of classrooms that can be part of a system. Higher bandwidth signals such as HDTV and high-resolution imaging can be transmitted without degrading signal quality.

The disadvantage is that more cabling infrastructure or electronics hardware (switching equipment) is required to put the system in place. A star topology is required for baseband. As mentioned earlier in this chapter, using a star-type infrastructure topology provides many important advantages over a "bus" infrastructure.

Installing a standards-based cabling infrastructure takes much of the guesswork out of video systems. The EIA/TIA 568 Network Cabling Infrastructure, for example, is a star-type network that will accept different types of systems – voice, video, and data – connected to its ends.

Voice Communications Systems

Today, the ability to use a telephone and to add voice communications to a desktop is not so much a luxury as a requirement for daily operations. Three primary phone systems of interest in an education environment include:

- Telephone company-provided services
- Key service unit
- Private branch exchanges

Telephone Company Services

Telephone company-provided services are called by many names including CENTREX, PLEXAR, and CENTRANET. With these services, switching, multi-line services, and special services such as voice mail, call waiting, and call forwarding are provided for a fee on each line. Charges are ongoing and are based on the service or combination of services. Generally, when a telephone system for a school building or school district reaches a certain size, it become more cost effective to use instead a PBX system that the district owns and controls.

An advantage is that the phone company can provide advanced system features without the cost of changing equipment or hiring staff to manage the system. A disadvantage is that the district pays a premium for each line and the services provided on that line on a monthly basis, as well as paying for each change of service.

Key Service Units

Key Service Units (KSU's), also known as key telephone systems, are the most basic level of multi-line telephone system. In the simplest KSU system, each telephone in a building has a button for each telephone line that comes into the building. Calls ring in on line 1, line 2, line 3, and so on, and the user presses a button to access each line.

KSU advantages include low cost and reliability. Generally, KSU's are designed for small applications that do not require special telephone features such as voice mail, call waiting, and call forwarding. Clouding the issue, hybrid KSU systems are in development to provide some calling features with the simplicity and low cost of a KSU-based system. KSU systems generally can be used effectively for individual small schools and/or administration buildings.

Private Branch Exchange

A private branch exchange (PBX) can serve large numbers of users in a building, or can be networked into a telephone system that can serve an entire school district. The PBX is essentially a smaller version of what the telephone company uses to provide voice and special telephone features to its customers. While more expensive than a KSU, a PBX often can be purchased and maintained by a school district for less than it would cost to purchase the same service from the telephone company.

A major advantage of a PBX system is the flexibility it provides the school district in establishing various levels of telephone service to all employees while simultaneously providing a method to scale up the system at relatively low cost. With a PBX, long distance calls can be automatically charged to appropriate department billing codes and personal long distance calls can be tracked. Programming services for a PBX can be acquired from the installing dealer. Alternatively, the school district can have a staff member trained to make the necessary moves, additions, and changes.

Data Network Systems

Early installations of stand-alone computers (computers not linked to each other) merely required power to operate. Computer labs were simply rooms where numbers of stand-alone computers were placed. When computers were "networked," they were only linked to a common printer through a mechanical switch.

The advent of local area network (LAN) technology enabled sharing software and various peripheral devices, saving time, money, and effort. Development of student information management software led to networking whole school buildings in LANs. The current trend is toward establishing wide area networks (WANs) to link buildings together and exchange data between and among sites.

The Internet as an educational tool has increased the demand for LANs, WANs, and classroom area networks (CANs, or LANs in classrooms). Educators are working hard to provide all of the connectivity necessary to meet the increasing demand for data information via school and district library online catalogs, CD-ROM, instructional materials databases, student information management, district student information management systems, school and district-wide e-mail, Internet curriculum materials, Internet e-mail, and more.

Network design in schools can be more challenging than in a business office environment and can require more robust network technology. Why? In business, the worker usually stays in one location most of the time and pursues relatively predictable and limited sources of data. In schools, students and teachers move more frequently from place to place and search for as wide a range of resources as the learning program requires. School users need to access wide-ranging resources from wherever they may be. Don't allow a network designer to merely adapt a business-type network for your school or district.

Even when they are out of the school building – at home or on a field trip – faculty and students ideally can link to the school or district network, or at least collect data digitally on computers, camcorders, digital cameras, and similar devices so they can easily transfer it to the network when the return to the building.

Networks today tend to be very complicated combinations of CANs, LANs, and WANs. Simple systems of yesterday – such as AppleTalk, LocalTalk, ARC Net, and Token Ring – have been replaced widely by the *defacto* standard, Ethernet.

Network speeds continue to change dramatically. For example, today's Ethernet is rapidly shifting from 10 MBs to 100 MBs of data transmitted per second. Like the ever-increasing speeds of computers, data network speeds continue to rise.

Networks currently are labor intensive, but proper design can mitigate that. One

way of making a data network less labor intensive is to select network hardware with management software that allows problems to be observed and corrected from a central location.

Unfortunately, the manufacturers that provide this type of software do not produce low-budget equipment, and you tend to get what you pay for in this area. While it's more expensive up front, equipment with management software and a wider range of standard equipment – such as switches, hubs, and routers – can save money in the long run by enabling a less labor-intensive network and a longer operating life. Schools should consider the value of paying more up front for dependable hardware and software to manage the network, as opposed to investing in additional personnel (and all the extra associated costs) to keep low-budget or hodge-podge design networks operating.

Most networks in schools began as small, single-segment entities. In simplest terms, a computer segment is a group of computers and other devices connected by a common cable or through a single hub. There is a practical limit to the number of computers that can be served by a segment. As use of computers has increased, schools have needed additional segments. A dilemma results when computer users on different segments need to access information on shared file servers. Three solutions can break up single-segment network structures and resolve this problem: bridging, routers, and switches.

Bridging is achieved by putting multiple network cards into a file server and linking each segment to the server via the network card. This method works in small applications but does not support accessing information beyond the file server.

Routers can be added to send information from one network to another. This allows the user to access information from any network. Routers must be configured and, once configured, cannot respond to dynamic changing network needs without reconfiguration.

Switches allow for more dynamic network operation. They provide linkage to various networks as needed. A switch will route data to the proper location without need for reconfiguration.

People, Staffing, and Positions

Internal and external staffing and services account for half the dollars spent on local area networks.

Yet far too often, technology planners fail to factor in the people who will assure a smooth-running network and quick response to problems. Be sure appropriate staffing is a part of any technology plan your school district creates.

There are no easy solutions, but common sense applies. Much depends on the level of technology in place and the size of the network. A school district

that has 30 elementary schools, 10 middle schools, and three high schools is likely to create a large network that requires a sophisticated staff of communications experts.

For a typical computer network, a school district may need to fill the following technical positions:

- **Technology director** Provides the overall vision for a district's technology plan as it dovetails with the school system's academic goals.
- **Systems administrator** Has the knowledge and experience to make a computer network run efficiently and makes sure that users have access to computer network servers.
- **Computer/network technicians** People who install hardware and software on users' computers and troubleshoot any problems that arise. These people can vary in number from one or two for a small, multi-building network to six or more for a large district network.
- **Webmaster** A unique combination of computer technician, marketing expert, writer, and graphic artist. This individual mediates between Web content authors (students, teachers, and administrators) and the system administrator in charge of hardware. The Webmaster ensures that the district's Web site is uniform in content, quality, style, and architecture; takes responsibility for the content; provides the tools needed to create Web content; and ensures that all the necessary standards are met. This position can command a high salary for top-of-the-line talent.

Technicians proficient in computer network management and trouble-shooting are always in demand, meaning they can command premium salaries. Many school districts find it difficult to keep these talented individuals working in the educational environment when they often can move to more lucrative positions in the commercial/private sector. A staffing dilemma develops: provide premium salaries to attract the necessary experts, or create a revolving door with technicians and managers leaving for better-paying positions elsewhere.

These positions do not have to be filled by district staff. Outsourcing – the practice of contracting network maintenance and management to an outside company – is a viable and effective option for many school districts and can provide several benefits. Outsourced employees can be used flexibly – such as hourly, per project, on site, or off site. And outsourced experts well-versed in the latest technology can be on call without the district incurring training costs.

Keep all of these factors in mind as your district plans its technology systems, and then look forward to a viable, robust, comprehensive communications system that can continue to grow.

Chapter 6: Marketing Strategies for Bond Issues

Marketing Strategies for Bond Issues

The relationship between a school district and its many publics greatly influences the probability of community support for building and technology initiatives. This chapter outlines how to use ongoing, honest communications to build understanding and support before announcing a building program. It then explores the basic steps for conducting a successful bond or levy campaign.

Defining Public Relations

The National School Public Relations Association (NSPRA) defines school public relations as a "planned, systematic, two-way process of communications between an educational organization and its internal and external publics [that is] designed to build morale, good will, cooperation, and support for the organization." As the definition suggests, effective school district public relations efforts must be intentional and ongoing and must provide an opportunity for two-way communications.

A common misconception is that a strong dose of public relations activity before a bond election is all that is needed to build support. In reality, the credibility and trust of a school district is built over years, not weeks. A sudden flurry of public relations activity in times of crisis can backfire if the public perceives it as insincere.

The most important concept in understanding public relations is that, regardless of facts, people's perceptions influence how they act toward your school district. A school bond election clearly illustrates this point. The school district and its supporters see the proposal as prudent and necessary. Opponents see the bond proposal as wasteful. Both sides back up their claims with facts. The lesson here is that facts become irrelevant in the argument. School district leaders must gauge how people think about the district and the

bond proposal. It is the public's perception and action that make or break the election, not the actual facts.

Assessing Needs

The ability to influence public thinking first requires knowledge of what specific groups within the public think. Many a proposal has been shot down because a veteran administrator or board members misunderstood what people wanted.

Common methods of gauging community thought are taking surveys, holding focus groups, gauging sentiment at school board meetings, keeping an eye on local letters to the editor, and making use of key communicators.

- **Surveys** can be performed in several ways. While written surveys are inexpensive, they also are less accurate than telephone surveys. Telephone surveys are labor intensive, yet usually are informative and reliable. Personal interviews are the most time consuming and labor intensive way of surveying public opinion, providing the most honest and thorough answers.

  The *PACE Manual* (Polling Attitudes of Community on Education, 1992) published by *Phi Delta Kappan* (available at 800/766-1156) probably is the most comprehensive guide to conducting school-related surveys.

- **Focus groups** bring together people with a common interest or job title to discuss their views. A moderator helps keep the group on task, talking openly, and away from personal issues.

- **School board meetings** provide a reasonably accurate gauge of community attitudes. If meetings regularly draw special interest groups, it is a signal that there are other organized groups dissatisfied with the school district. Then, too, intraboard relationships and the board's relationship with the public often are a reflection of how the entire school district is perceived.

- **Letters to the editor** in local newspapers can be easy to ignore. Don't. They are one of the more widely read parts of the newspaper. Make it a habit to track public opinion on school issues -- and its accuracy -- through the local papers.

- **Key communicators** are citizens whose opinions are well respected in the community. In turn, they share comments and concerns their constituents express about schools. (See more information about key communicators later in this chapter.)

Tailoring Your Message

By measuring how different groups look at your school district and then tailoring specific messages to those groups, you can maximize the effects of your public relations efforts.

Again using a bond election as an example, this means that different messages should be sent out to different

groups. Parents want to know how the expenditure will improve student performance. Home-owners want to know how it will affect taxes. Business leaders want to know how improved school facilities will help sell the community to outsiders.

All of these concerns are legitimate, and each requires a different message. The "cannon approach" of bombarding a community with the same message usually is expensive and ineffective.

First Person Communications

The most effective approach for selling a new idea or a facilities program to a community is to make people feel as though they are part of that decision. This is achieved by first-person experiences with the schools. Two-way communications make people feel involved and enable necessary feedback to the school district.

Here are some examples of ways to give your various publics first-person contact with the schools:

- Advisory committees
- Open houses and special events
- Weekly breakfasts for patrons and employees
- Web site with option for e-mail feedback
- Community education courses
- Parenting-skills workshops
- Meet the superintendent/board night
- Realtor or clergy luncheons in schools
- Education fairs at schools or malls

Support Begins at Home with Internal Communications

Employees can be the best and the worst public relations representatives for your school district. Employees who understand an organization's goals and believe in them can sell ideas and programs simply through their actions and comments. Likewise, they can destroy the best ideas with negative actions and comments in the community.

The importance of communicating honestly and frequently with all internal audiences in the school district cannot be overlooked. Employees represent the most credible source of information for many patrons. They can also become your strongest supporters for building and technology initiatives if they feel a part of decisions and believe in the directions of change.

The best internal communications are short, easy to understand, and relevant to employee needs. Effective internal communications activities can include:

- Orientation and mentoring programs for new employees
- Recognition dinners/receptions
- Pay envelope "stuffers" with brief news items

- Public relations workshops for secretaries
- Walls displaying teacher biographies or diplomas
- Substitute teaching by administrators in schools
- Employee social/recreational committees
- Employee focus-groups and advisory committees
- Staff newsletters

Community Support Builds Through External Communication

There probably will always be a modest level of cynicism and mistrust among some school patrons. But a good, ongoing external communications program prevents those negative influences from gaining momentum during bond elections or building campaigns.

Three common strategies for building community support are:

- Direct contact or first-person activities
- Self-directed activities
- Media-relations activities

In examining each of these strategies, keep in mind that the most effective activities actively involve people instead of treating them as passive readers or listeners.

Direct Contact Activities

In addition to the first-person communication strategies mentioned earlier in this chapter, a school district needs to maintain regular contact with important publics. These publics generally include parents, local government officials, business and industry representatives, service organizations, senior citizens, and the religious community.

A good external public relations program promotes dialogue about your schools with these groups through public presentations and special events in the schools. Print and electronic communications can then reinforce attitudes about your schools.

A highly successful and inexpensive method to promote dialogue is the key communicator program, which establishes a network of informed patrons who represent a cross section of all external publics.

The process starts with a single meeting of 20 to 30 people identified by the school or school district as community opinion leaders. They might be elected officials or they might be hairdressers, but they help shape opinion. The first and only meeting of the group should outline the school district's mission, long-range plans, immediate successes, and challenges. Treat the meeting as a conversation with a friend instead of a sales presentation. Following a question-and-answer session and possibly a tour, ask the participants to contact your

office if they have any questions or hear rumors about the schools. In turn, you promise to keep the key communicators "super-informed" about major school initiatives and activities through means such as print and telephone communications.

This informal process can be repeated as often as necessary until you build a key communicator network from the small group meetings.

Self-Directed Activities

Most people look to print and electronic communications to find accurate information about your schools. Many actively take the initiative to read and view district newsletters, annual reports, activity calendars, handbooks, informational videos, Web sites, and cable television public-access channels.

The motto "if you can't do it right, don't do it at all" applies to all of these publishing ventures. If you produce a poorly written newsletter or an ineffective Web site, you are sending a message to the community that you are not professional. If staffing or financial restraints limit your ability to produce quality materials, then look outside for funding and/or assistance.

Some basic tips for producing quality print and electronic communications include:

- Always write to the intended audience, doing so in a conversational way. Avoid educational jargon or condescending language.
- Apply the 30-3-30 rule to newsletters. Include something for 30-second readers (headlines and photo captions), 3-minute readers (strong lead sentences), and 30-minute readers (concise stories).
- Don't desktop publish your materials to death. Use a minimum of fonts in publications. Remember that your goal is for people to read and remember, not just admire the look.
- Always include stories about schoolchildren and classroom activities. Don't get trapped into focusing only on construction and new technologies; show how these changes will improve classroom instruction.
- Don't be afraid to admit your school district has problems, such as low test scores or worn buildings. Patrons understand that no one is perfect. What they want to know is how you will improve. What is the plan?
- Pay close attention to the audio track on video and slide presentations. The best visuals are lost when a poor or cheap soundtrack is attached. It's usually worth paying for professionally produced sound, even if you are producing your own video or slides.
- Limit the number of graphics and special effects on your home page on the Web. The more you add, the more people will be unable to access your site for lack of powerful enough computers and connections.

- In all communications, honestly ask yourself "who cares?" Information for information's sake is a waste of everyone's time. If it does not have a specified purpose, why produce it? Get out and meet some people instead!

Media Relations

No matter how well you create a school district "voice" in the community, a majority of patrons will still receive their school news from newspapers, television, and radio. That's why your relationship with reporters, editors, and publishers is important to your overall public relations effort.

Here are some strategies for making the relationship a positive one:

- Learn to recognize school news. If you know what reporters are looking for, you are less likely to waste their time.
- Answer questions honestly and promptly. Your credibility with a reporter is lost forever if you lie or purposely mislead.
- Don't be afraid to say "I don't know." Learn how to say it, then follow up by finding the answer. Take time to gather accurate information, especially in times of crisis.
- Treat reporters as professionals. If you have praise for them, praise them in public; raise concerns to them in private.
- Remember that nothing is truly "off the record."
- Never ask to see a story before it is published. If you are unhappy with a published story, contact the reporter. Then, if necessary, contact the editor or news director.
- Think of news coverage as a partnership, not a war. The media often need you as much as you need them. In the rare cases where negative press becomes unreasonable, remember you are never obligated to talk with reporters, nor are you obligated to allow them access to school employees or students. You only need to provide information that is required under your state's "sunshine" laws.

Conducting a Bond Campaign

Bond campaigns, like political campaigns, rely on long-range planning to build awareness, support and, ultimately, a positive vote.

The process for moving people from tacit support to the voting booth involves all the components previously mentioned in this chapter: needs assessment, targeting messages, and internal and external communications. This section examines how each of these components is applied to a bond election campaign.

Getting Started

Some of your most important work comes before you announce a bond election. A survey of community attitudes in advance of calling for an election will provide an honest gauge of sentiment toward a bond levy. The

survey also can measure people's tolerance to higher taxes, if necessary, and their understanding of the need for a bond election. Many districts choose to hire an outside consultant to complete a survey, as well as to perform election-day calling and exit-poll surveys.

Building the case for a major technology initiative or building program is vital to the overall campaign. Once the decision is made to proceed, the school district should disseminate the details in as many ways as possible. This might include mailing the entire report to your key communicators, preparing a press kit for the announcement, and sending a memo or fact sheet to all employees.

Another early step in the process is registering voters. Check local election laws for the procedures and deadlines. Then enlist volunteers — PTA members, for instance — to conduct a registration drive. Voter activity lists from previous elections can provide valuable information on where to target your voter-registration campaign.

Getting the Word Out

Using information gathered through the survey, schedule presentations with groups that seem sure to support or might support the bond proposal. Keeping these groups well informed is more important then attempting to persuade negative patrons to change their vote.

The following are some successful strategies for communicating your bond issue details to the community:

- Carefully study your state's bond election campaign laws. Know exactly what you can and cannot spend bond money on. Have all printed materials read by at least three different people, including the school attorney, if possible. A mistake here could throw out the entire election results.
- Prepare and customize a short but informative multimedia or slide presentation to reach different groups. One presentation might stress the technology upgrades to an older building, while another might highlight community access to new technology labs. Video is also an excellent medium for presentations, but only if the product is of high quality and can be changed for different groups.
- Customize handouts for each presentation. Desktop publishing makes it easy to include a section on how each particular audience can benefit from the bond issue.
- Schedule your first presentation with employee groups. They need to be informed early, and you can test your presentation on a friendly audience before taking it on the road.
- Enlist the help of patrons and the school board in giving presentations. The message is often more credible if it does not come from the superintendent or central office staff.
- Don't overlook non-English speaking populations within your district. Have your brochure or fact sheet translated from English into the ap-

propriate languages and have speakers of those languages "on-call" to comment and translate if these patrons have questions.

- Try to include pictures of schoolchildren and teachers in your presentations. Computers and school blueprints alone do not communicate the business of educating children.
- Look to cable television and public access channels for new ways to get the word out. Cable companies often have technicians available to help produce shows in company studios.
- Super-communicate with administrative leadership. Don't overlook the power that principals and other administrators have in swaying employee opinions.

Getting the Voters Out

As the election approaches, the school district should rely more and more on first-person contacts. The general bond information should be "on the street." Now it is time to get out and encourage people to vote.

Phone banks/phonathons are still an effective way to get people out to vote. Getting presentations on the agendas of public meetings, such as those of the city or county council, also help keep your bond issue in the news.

Other strategies might include:

- Sending a voting reminder home with every student (remember never to suggest how people should vote)
- Making lunchtime presentations at industrial plants
- Erecting interactive displays at malls, showing what the new technology proposed in the bond issue can help the school district accomplish

If you start planning early and follow the advice outlined here, your bond election has a good chance of being a public relations — and a school district – success.

Top Tips for Getting the Job Done

There is no such thing as a sure thing in bond elections, but you can take steps to increase the probability of success. Here are several ideas that can help your school district carry out a successful bond campaign.

- Establish a key communicator network and communicate with it regularly during the campaign.
- Make use of resources such as the National School Public Relations Association's *Win at the Polls* (available at 301/519-0496).
- Begin planning at least six months in advance of the bond election to have time to survey and plan adequately.
- Research your voters. Conduct a voter-attitude survey and identify key areas of discontent.
- Set the election date to avoid possible conflicts. Never plan an election near the date annual tax statements are distributed or around April 15, when most people's tax returns are due.
- Create flexible presentations that can be adjusted for various audiences (this means that slides might work better than video).
- Include schoolchildren's photos in presentations, not just technology charts and blueprints.
- Solicit the support of citizen groups or action committees, then conduct training sessions for volunteers to assure a consistent message is communicated.
- Make sure printed communications are 100 percent accurate. They should be printed on simple, inexpensive paper for an austere "look."
- Time distribution of your publications. Go for early awareness, and then send out a reminder close to election day.
- Look to alternative communication methods, such as the World Wide Web and cable television.
- As quickly as possible after the election, meet to examine what worked and what did not. Take notes. They will be valuable in preparing for the next bond election.

Recommended Resources

American School & University. Monthly magazine. Special and regular issues cover school facility design and technology. Availability information at http://www.asumag.com.

Association for Supervision and Curriculum Development. (1995) *Designing Places for Learning.* Availability information at http://www.ascd.org/catalog/catalog.html.

Bushweller, Kevin. (1996) Selling Technology Bonds. *Electronic School,* September 1996, National School Boards Association. Available at http://www.electronic-school.com/0996f7.html.

Castaldi, Basil. (1994) *Educational Facilities: Planning, Modernization, and Management.* Allyn & Bacon. Availability information at http://www.amazon.com (search by author's name).

Council for Educational Facility Planners International (8687 E. Via De Ventura, Suite 311, Scottsdale, AZ 85258, 602/948-2337). CEFPI, a membership organization, publishes a directory of architects, construction managers, planners, engineers, technology consultants, and manufacturers who are CEFPI members and pay for inclusion in the directory. That directory, publications, and related information are available at http://www.cefpi.com.

Gayeski, Diane. (1995) *Designing Communication and Learning Environments.* Englewood Cliffs, NJ: Educational Technology Publications Inc.

Illinois Association of School Boards. *Good School Maintenance,* Third Edition. Availability information at http://www.iasb.com/files/pubcat.htm#Books&Manuals:SchoolManagement.

McKenzie, Jamie. (1998) Networking Schools: Managing Quandaries, Dilemmas and Conundrums. *From Now On: The Educational Technology Journal,* April 1998. Available at http://fromnowon.org.

National School Boards Association. *Electronic School.* Quarterly insert in *American School Board Journal.* See http://www.electronic-school.com for article archives with search capability.

National School Boards Association. *Learning by Design*. Annual insert *in American School Board Journal*. See http://www.asbj.com for subscription information and *ASBJ* article archives.

National School Boards Association Council of School Attorneys. (1991) *Contracting with Architects: A School District's Perspective*. Available by calling NSBA at (703) 838-6722.

National School Public Relations Association. *Win at the Polls*. Availability information at http://www.nspra.org.

Phi Delta Kappan. (1992) *PACE Manual* (Polling Attitudes of Community on Education). Availability information at http://www.pdkintl.org.

U.S. Department of Education. (1998) *A Back to School Special Report on the Baby Boom Echo: America's Schools are Overcrowded and Wearing Out*. Available at http://www.ed.gov/pubs/bbecho98. See http://www.ed.gov/MailingLists/EDInfo/msg00390.html for related information.

Glossaries

Architectural Terms

The following architectural term definitions are excerpted from *The Architect's Handbook of Professional Practice, Volume 2: The Project* (1994), reproduced with permission of its publisher, the American Institute of Architects, 1735 New York Avenue, NW, Washington, DC 20006.

Additional services *(of the architect)*: professional services that may, if authorized or confirmed in writing by the owner, be rendered by the architect in addition to *the basic services* or *designated services* identified in the owner-architect agreement.

Architect: designation reserved, usually by law, for a person or organization professionally qualified and duly licensed to perform architectural services.

Basic services *(of the architect)*: the architect's basic services consist of the phases described in the owner-architect agreement that are provided for basic compensation. AIA Document B141, for example, includes a specific basic services package for schematic design, design development, construction documents, bidding or negotiation, and construction contract administration. Distinguished from *additional services*.

Bid: a complete and properly signed proposal, submitted in accordance with the bidding requirements, to perform the work or a designated portion thereof for the amount or amounts stipulated therein.

Bidding documents: collectively, the bidding requirements and the proposed contract documents, including any addenda issued prior to receipt of bids.

Bidding or negotiation phase: the phase of the architect's services during which competitive bids or negotiated proposals are sought as the basis for awarding a contract.

Codes: regulations, ordinances, or statutory requirements of a government unit relating to building construction and occupancy, generally adopted and administered for the protection of public health, safety, and welfare.

Conditions of the contract: those portions of the contract documents that define the rights and responsibilities of the contracting parties and of others involved in the work. The conditions of the contract include *general conditions*, *supplementary conditions*, and other conditions.

Construction budget: the sum established by the owner as available for construction of the project, including contingencies for bidding and for changes during construction. Distinguished from *project budget*.

Construction contract administration: the phase of the architect's services that includes the architect's general administration of the construction contract(s). These services include reviewing and certifying amounts due the contractor, approving the contractor's submittals, preparing change orders, and conducting site inspections to determine dates of substantial completion and final completion.

Construction cost: as used for calculating the architect's compensation, or as a fixed limit in the owner-architect agreement, this is the total cost or estimated cost to the owner of all elements of the project designed or specified by the architect, including the cost at current market rates of labor and materials furnished by the owner and equipment specified, selected, designed, or specially provided for by the architect (plus a reasonable allowance for the contractor's overhead and profit). Construction cost also includes a reasonable allowance for contingencies for market conditions at the time of bidding and for changes in the work during construction; however, it doesn't include compensation of the architect and the architect's consultants or the costs of the land, rights-of-way, financing, or other costs that remain the responsibility of the owner.

Construction documents: drawings and specifications that set forth in detail requirements for the construction of the project.

Construction documents phase: the phase of the architect's services in which the architect prepares the construction documents from the approved design development documents and assists the owner in the preparation of the bidding documents.

Construction management: management services provided to an owner of a project during the design phase, construction phase, or both by a person or entity possessing requisite training and experience. Such management services may include advice on the time and cost consequences of design and construction decisions, scheduling, cost control, coordination of contract negotiations and awards, timely purchasing of critical materials and long-lead items, and coordination of construction activities.

Construction manager: an individual or entity who provides construction management services. This entity may remain as adviser (Cma) during construction or become the construction contractor (CMc).

Contingency allowance: a sum included in the project budget to cover unpredictable or unforeseen items of work or changes in the work.

Contract documents: these include the agreement between owner and contractor; conditions of the contract (general, supplementary, and other conditions); drawings, specifications, and addenda issued prior to execution of the contract; other documents listed in the agreement; and modifications issued after execution of the contract.

Designated services *(of the architect)*: those services agreed to be performed by the architect either directly or through consultants. Used specifically in AIA Document B163, where services are designated from an established list.

Design development documents: drawings and other documents that fix and describe the size and character of the entire project as to architectural, structural, mechanical, and electrical systems, materials, and such other elements as may be appropriate.

Design development phase: the phase of the architect's services in which the architect prepares the design development documents, from the approved schematic design studies, for submission to the owner for the owner's approval.

Detail: a drawing, explanatory of another drawing, indicating in detail and at a larger scale the design, location, composition, and correlation of elements and materials.

Detailed estimate of construction cost: a forecast of construction cost prepared on the basis of a detailed analysis of materials and labor for all items of work, as distinguished from a *preliminary estimate of construction cost* based on current area, volume, or similar unit costs.

General conditions *(of the contract for construction)*: that part of the contract documents that sets forth many of the rights, responsibilities, and relationships of the parties, particularly those provisions that are common to many construction projects.

Internal project budget: resources allocated by a design firm for performance of its obligations with respect to a particular project.

Preliminary estimate of construction cost: cost forecasts prepared by the architect during the schematic design, design development, and construction documents phases of basic services for the owner. In AIA Document B141, these are based on current area, volume, or similar unit costs. Distinguished from *detailed estimate of construction cost*.

Project budget: the sum established by the owner as available for the entire project, including the construction budget; land costs; costs of furniture, furnishings, and equipment; financing costs; compensation for professional services; costs of owner-furnished goods and services; contingency allowance; and similar established or estimated costs. Distinguished from *construction budget* and the architecture firm's *internal project budget*.

Record drawings: construction drawings revised to show significant changes made during the construction process, usually based on marked-up prints, drawings, and other data furnished by the contractor to the architect. This term is preferable to as-build drawings.

Schematic design documents: drawings and other documents illustrating the scale and relationship of project components.

Schematic design phase: the phase of the architect's services in which the architect consults with the owner to ascertain the requirements of the project and prepares schematic design studies consisting of drawings and other documents illustrating the scale and relationships of the project components for approval by the owner. The architect also submits to the owner a preliminary estimate of construction cost based on current area, volume, or other unit costs.

Supplementary conditions: a part of the contract documents that supplements and may also modify, change, add to, or delete provisions of the general conditions.

Technology Infrastructure Terms

Coaxial cable - Copper cable consisting of a single, solid copper core surrounded by an insulating material wrapped in a braided wire shield. Commonly used in cable television installations.

Communications closet - Distribution area for communications cables and distributed electronics.

Communications network - Connections and communication between electronic hardware designed to carry voice, video, and data information.

Fiber-optic cable - Cable that uses glass and light (rather than copper and electrons) to carry information. It has enormous communications carrying capacity. Two major types of fiber, multimode and singlemode, dictate distances and carrying capacity. Multimode is suitable for distances less than 1000 M, singlemode for distances over 1000 M.

Information outlet - Point of connection in a room or office between terminal hardware and the communications network. Sometimes referred to as I/O.

Infrastructure - The cabling used to carry voice, video, and data signals.

Minimum bend radius - A critical measurement of the smallest bend that a cable length may take during and after installation. Exceeding the minimum bend radius is the equivalent of kinking a garden hose with the water on — the output is greatly reduced or stopped altogether.

Multiplexor - An electronic device that prepares electronic signals to be transmitted.

Network center - The center of a star-network or homerun-network topology. All cables are run to a network center where they are connected to electronic hardware. Also known as head-end, switch room, computer room.

Switch - A device that routes a signal directly from point to point.

Termination - End point of a communications cable. Homerun cables are terminated at the network center and the information outlet.

UTP Cable - Unshielded twisted pair copper cable (a type of phone cable). Small gauge copper cables twisted into pairs. Different categories are used to indicate the electrical specifications of the cable. Categories can be used as a general guideline for data carrying capacity. Category 3 and Category 5 are the most commonly used in communications infrastructures.

Publications of the National School Boards Association's Institute for the Transfer of Technology to Education and its Technology Leadership Network

Technology & School Design: Creating Spaces for Learning (1998) Softbound, 124 pages. Whether you're designing new school buildings or remodeling old ones, this essential guide will help you plan for the technology you need, hire skilled architects and technology consultants, work with those professionals to design effective learning spaces, choose the best strategies and equipment, stay within budget, and develop community support and funding. You'll want to consult this book – written by leading school architects and technology consultants – as you develop technology plans, make upgrades to school and district infrastructure, and refine the synergy between people and facilities in your learning environment. TLN & NA price $28; regular price $35. Order #03-143-43

Education Leadership Toolkit: A Desktop Companion (1997) Softbound, 32 pages. This toolkit is a concise introduction to the issues that school board members and other education leaders often face as they integrate technology into their districts' activities and operations. Designed to prompt discussion and exploration, the Desktop Companion is divided into scenarios with questions to consider, followed by tips and resources for developing an approach to the issues raised. The publication offers a user-friendly approach to navigating the wealth of material available in the Education Leadership Toolkit Web site (http://www.nsba.org/sbot/toolkit). TLN & NA price $8; regular price $10. Order # 03-142-43

Investing in School Technology: Strategies to Meet the Funding Challenge / School Leader's Version (1997) Softbound, 80 pages. Providing cost estimates, matrices, and case studies, this book provides how-to help for improving your technology funding practices. NSBA, with support from AT&T Capital Corporation, has developed this *School Leader's Version* based on a report developed by the U.S. Department of Education's Office of Educational Technology and available at the department's Web site. The *School Leader's Version* tailors information specifically to the needs of school leaders and includes a guide to recommended resources on funding, technology, and education reform. TLN & NA price $20; regular price $25. Order # 03-140-43

Technology for Students with Disabilities: A Decision Maker's Resource Guide (1997) Softbound, 100 pages. This valuable guide helps education leaders recognize technology as an essential ally in the effort to aid students who have learning problems, major cognitive disabilities or physical disabilities, and offers strategies for technology implementation to improve curriculum, assessment and administration. Readers will find assistance in evaluating their needs; choosing and funding technology; and creating policy frameworks, long-range technology plans and due process procedures. An extensive resource list (also available on the Web at http://www.nsba.org/itte) provides contact information and describes national, state and local organizations, information centers, clearinghouses and researchers who offer assistance. Published by NSBA and the U.S. Department of Education's Office of Special Education Programs. NSBA Technology Leadership Network and National Affiliate district price $20; Regular Price $25. Order # 03-138-43

Leadership & Technology: What School Board Members Need to Know (1995) Softbound, 194 pages. School districts need an informed school board to help technology plans move forward. Topic by topic, issue by issue, this book grounds board members in the knowledge they need to ask the right questions and initiate appropriate policies regarding technology use in schools. In an easy-to-read, discussion guide format, it helps the board — and administrators — hurdle the barriers to change, understand the importance of their leadership, prepare for technology planning, and confront important technology-related issues such as purchasing, staff development, curriculum revision, facility improvement, and evaluation. An extensive glossary and bibliography further support readers along the learning curve. TLN & NA price $28; regular price $35. Order # 03-135-43

Plans & Policies for Technology in Education: A Compendium (1995) Softbound, 250 pages. Presenting a wide collection of numerous school districts' actual technology plans and policies, this is a reference work and guide that school leaders have long needed. Divided by plans/policies and then by topic — such as purchasing, copyright, network/Internet use, ethics, staff development, curricular integration, technology access, equity, community involvement, evaluation, and more — the appropriate portions of 35 districts' formatted documents appear as samples to consider when creating and revising your own plans and policies. In separate sections, the book also guides administrators and board members through the steps of planning and policy-setting, provides tips and warns of traps, reprints full technology plans, offers sample job descriptions and survey guides, and recommends additional resources. TLN & NA price $28; regular price $35. Order # 03-133-43

Electronic School (Quarterly magazine, approx. 40 pages) Designed as a helpful resource for all school personnel, *Electronic School* colorfully covers school technology trends and presents case studies that reveal strategies of K-12 schools nationwide. Feature articles look in-depth at topics such as staff development, funding, telecommunications, and school restructuring. Published by NSBA's magazine, *The American School Board Journal*, *Electronic School* is mailed to 12 designated contacts in each NSBA Technology Leadership Network school district as a benefit of membership. To receive *Electronic School* as a quarterly supplement *to The American School Board Journal*, dial (703) 838-6721. Per issue: TLN & NA price $4; regular price $5. Order # 03-101-43

Technology Library: All seven of the above publications. TLN & NA price $115; regular price $145. Order # 03-139-43

Telecommunications and Education: Surfing and the Art of Change (1994) Softbound, 124 pages. This easy-to-read guide helps telecommunications novices consider the benefits and learn the basics of going online using computer, telephone, and modem. The authors, education technology consultants, recommend that educators first use smaller telecommunications networks before they venture onto the worldwide Internet "network of networks." Contact information is provided both for Internet and other network access providers. A glossary, resources, sample policies for Internet use, and a needs assessment chart are included. TLN & NA price $28; regular price $35. Order # 03-131-43

Multimedia and Learning: A School Leader's Guide (1994) Softbound, 116 pages. This is a comprehensive guide for school leaders seeking to implement multimedia. It includes descriptions of multimedia technologies and trends; research-based studies and theories of multimedia environments; actual case studies of multimedia in schools; multimedia applications for education; facilities planning, staff development, and copyright issues; a glossary; and recommended information sources. TLN & NA price $28; regular price $35. Order # 03-129-43

Teachers and Technology: Staff Development for Tomorrow's Schools (1991) Softbound, 184 pages. School leaders who help teachers learn to apply technology will find methods, philosophies, research, resource lists, and case studies in this guide. Planning, peer training, Constructivist training, internship opportunities, and distance learning are among the topics discussed. TLN & NA price $28; regular price $35. Order # 03-107-43

Technology Leadership News, the newsletter of NSBA's ITTE, is filled with information on new issues, trends, products, programs, technology applications, district profiles, case studies, government initiatives, funding, video conferences, and other opportunities and news of interest. Written in layman's terms and published nine times annually, it is mailed to 12 individuals in each NSBA Technology Leadership Network school district as a benefit of TLN participation. TLN participants also receive full-staff copying/distribution rights. Others may purchase annual subscriptions for $75. Order # 03-119-43

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4/98

about NSBA...

The National School Boards Association is the nationwide advocacy organization for public school governance. NSBA's mission is to foster excellence and equity in public elementary and secondary education in the United States through local school board leadership. NSBA achieves its mission by amplifying the influence of school boards across the country in all public forums relevant to federal and national education issues, by representing the school board perspective before federal government agencies and with national organizations that affect education, and by providing vital information and services to Federation Members and school boards throughout the nation.

NSBA advocates local school boards as the ultimate expression of the unique American institution of representative governance of public school districts. NSBA supports the capacity of each school board—acting on behalf of and in close concert with the people of its community—to envision the future of education in its community, to establish a structure and environment that allow all students to reach their maximum potential, to provide accountability for the people of its community on performance in the schools, and to serve as the key community advocate for children and youth and their public schools.

Founded in 1940, NSBA is a not-for-profit federation of state associations of school boards across the United States and the school boards of the District of Columbia, Guam, Hawaii, and the U.S. Virgin Islands. NSBA represents the nation's 95,000 school board members. These board members govern 14,772 local school districts that serve more than 46.5 million public school students—approximately 90 percent of all elementary and secondary school students in the nation. Virtually all school board members are elected; the remainder are appointed by elected officials.

NSBA policy is determined by a 150-member Delegate Assembly of local school board members from throughout the nation. The 24-member Board of Directors translates this policy into action. Programs and services are administered by the NSBA executive director, assisted by a professional staff. NSBA is located in metropolitan Washington, D.C.

NSBA's Mission Statement

The mission of the National School Boards Association, working with and through all its Federation Members, is to foster excellence and equity in public education through school board leadership.

NSBA's Shared Vision

NSBA and its Federation Members represent 95,000 local school board members who are dedicated to educating every child to his or her fullest potential. In 1996, Federation leaders came together to forge a plan for increasing student achievement through school board leadership. This effort coalesced into a strategic vision—a vision of the National School Boards Association as a powerful, united, energetic Federation...as the premier advocate for public education...as an influential force for achieving equity and excellence in public education...and as a catalyst for aligning the power of the community on behalf of education.

Underlying this shared vision are certain bedrock convictions:

1. belief that effective local school boards can enable all children to reach their potential
2. conviction that local governance of public education is a cornerstone of democracy
3. belief in the power of local school boards to convene the community around education issues
4. conviction that together, local school boards can influence education policy and governance at the state and national levels
5. commitment to the principle that through collaboration comes impact
6. belief that the strength of local school board leadership arises from the board's capacity to represent the diversity of students and communities

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